

Exhibit 14.17

United States' Motion to Enter Consent Decree,
United States v. Alden Leeds, Inc. et al., Civil Action No. 22-7326 (D.N.J.)

EXHIBIT A-59

Appendix A to OxyChem's Comments in Opposition to Proposed Consent Decree,
United States v. Alden Leeds, Inc., et al., Civil Action No. 2:22-cv-07326 (D.N.J.)

**SITE INVESTIGATION/REMEDIAL
INVESTIGATION REPORT
VOLUME I - REPORT
PITT-CONSOL SITE
NEWARK, NEW JERSEY**

May 2000

Project No. D2PC7245

Prepared by



CORPORATE REMEDIATION GROUP
An Alliance between
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DuPont Engineering

May 26, 2000

Matthew Turner
Bureau of Federal/State Case Management
Division of Responsible Party Site Remediation
P.O. Box 028
Trenton, NJ 08625-0028

Dear Matt,

I have enclosed three copies of the DuPont Pitt-Consol Site Investigation/Remedial Investigation (SI/RI) Report. One copy of laboratory data deliverables is being submitted under separate cover because its sheer volume necessitates special handling.

The SI/RI Report summarizes the data and findings from an extensive field and laboratory investigation. Well over 200 samples were collected and analyzed from numerous locations designed to assess the impact from one hundred years of chemical manufacturing. We believe these data, coupled with information gleaned from 10 years worth of previous investigations, is more than adequate to accomplish study objectives and facilitate site reuse via our presumptive remedy of emplacing an engineered cover over contaminated site soils.

Upon review of the SI/RI Report, you will see our conclusions and recommendations itemized in Section Seven. I have summarized the key conclusions below.

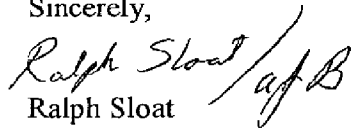
- ☐ Surficial fill over all but the former administration area is contaminated with Polynuclear Aromatic Hydrocarbon (PAH) compounds. However, we believe that the underlying peaty clay (meadow mat) has restricted vertical migration of those compounds.
- ☐ Potentially significant source areas were not identified but, in order to facilitate redevelopment of the site, we outlined five areas, primarily associated with former lagoons, for further consideration.
- ☐ Shallow groundwater contamination is being naturally attenuated through biological degradation and shallow groundwater quality at the downgradient property line generally is within New Jersey Class IIA Groundwater Standards.
- ☐ Our presumptive remedy of an engineered soil cover would address direct contact with site soils, the only significant potential exposure pathway.

As you know, we are very interested in returning this site to productive use as soon as possible. New Jersey's Brownfields and Contaminated Site Remediation Act was meant to facilitate cleanup of such sites by removing impediments in the law and creating incentives. We believe the process we collectively set in motion with this investigation can be a positive example of the Act's potential (i.e., a flexible approach combining the site investigation and remedial investigation steps, and considering future land use and site-specific risk).

We are recommending a phased approach to site remediation. First, we request your approval of this report and our proposal to develop a remedial action work plan (RAWP) focusing on five areas requiring further attention. Second, upon your approval of the RAWP, we, in partnership with a developer, propose to design and construct a cover for site soils integrated with future industrial/commercial land use.

Al Boettler will call you in a few weeks to check on the status of your review and, if you feel it beneficial, plan a meeting to discuss your preliminary comments. In the mean time, feel free to call Al Boettler at 302-892-0647 if you have any questions.

Sincerely,

Handwritten signature of Ralph Sloat in cursive script, with the initials 'afB' written below the signature.

Ralph Sloat
Site Director

DuPont Corporate Remediation Group

cc: Edward Seger, DuPont CRG, Pompton Lakes
Al Boettler, DuPont CRG
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File: PC.7245.0300

SITE INVESTIGATION/REMEDIAL INVESTIGATION REPORT VOLUME I – REPORT DUPONT PITT-CONSOL SITE NEWARK, NEW JERSEY

May 26, 2000

Project No. D2PC7245



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Ralph Sloat
DuPont CRG
Site Director

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Robert B. Genau
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Geologist

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Executive Summary

The Pitt-Consol site consists of approximately 37 acres and is located in Essex County at 191 Doremus Avenue, Newark, New Jersey, 07105. The facility ceased manufacturing operations on May 23, 1983, and the entire facility was dismantled by January 1986. DuPont entered into a Memorandum of Agreement (MOA) with New Jersey Department of Environmental Protection (NJDEP) on March 20, 1998 to conduct a cleanup of the property. DuPont submitted a Preliminary Assessment (PA) of the site in April 1998. NJDEP approved DuPont's Site Investigation/Remedial Investigation (SI/RI) Work Plan on July 14, 1999.

The objective of the SI/RI was to determine the nature and extent of soil and groundwater contamination from past manufacturing operations. Investigations were performed on the following media:

- ☐ On-site soil
- ☐ On-site groundwater
- ☐ On-site lagoons
- ☐ Off-site soil and groundwater

The on-site investigations involved sampling areas of concern (AOCs), including AOC 1—manufacturing/storage area, AOC 2—pitch storage and tar tank farm, and AOC 3—former lagoons. In addition, an on-site investigation of the former administration area was conducted. On-site groundwater was investigated by sampling 12 existing monitoring wells and seven replacement wells.

Off-site soil and groundwater contamination were assessed through an evaluation of data collected from reviewing public files and assessing soil and groundwater contamination at the site perimeter. Due to the significant number of off-site contamination sources, industrial filling of the area, the fact that primary constituents of concern (COCs) at the site are commonly found in asphalt roadways and macadam (which surround the site), and the existence of multiple upgradient sites with similar constituents of concern, DuPont believes that additional efforts to delineate constituents off-site to residential soil criteria are unwarranted.

During this SI/RI, 204 soil samples, seven lagoon characterization samples, and 19 groundwater samples were collected and analyzed. In addition, 13 permeability tests were conducted, seven replacement monitoring wells were installed, groundwater levels were measured in monitoring wells, and a file search on off-site properties was conducted. DuPont's assessment of these data plus previous data and information (see the *Preliminary Assessment—Pitt-Consol*; CRG 1998) resulted in the conclusions listed below.

- ☐ *Site Characterization Complete*
Data from over 200 samples coupled with information gleaned from 10 years worth of previous investigations were adequate to accomplish study objectives and facilitate site reuse via our presumptive remedy – engineered soil cover. Additional efforts to delineate constituents to residential soil criteria offsite are unwarranted because primary COCs at the site are commonly found in asphalt roadways and macadam (which surround the site) and at neighboring properties.



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Executive Summary

❑ *Vertical Extent of Soil Contamination*

The peaty clay layer appears to be an effective barrier to vertical migration and is therefore considered the vertical extent of contamination. In AOC 3, where the peaty clay layer is less than 2 feet or possibly absent, contamination may extend to the deeper sand aquifer

❑ *Significant Source Area(s)*

A practical definition of source area has been developed to identify and assess contaminated areas that potentially require mitigation. The definition below was used to outline such areas and determine the depths of concern. An area was considered a potentially significant source if the following conditions were met.

- Presence of at least one contaminant in soil at a concentration of more than 1,000 times it's relevant criteria; *and*
- Presence of that same contaminant in groundwater (as detected in monitoring well(s) near the downgradient property line) at a concentration more than 10 times the New Jersey Class IIA groundwater standard criteria.

Based on the definition above, no potentially significant source areas were identified on the site.

❑ *Areas to Address in Remedial Action Work Plan*

In order to facilitate redevelopment of the site, DuPont proposes to address areas characterized solely by a single soil contaminant exceedence in excess of 1,000 times the relevant criteria. Five such areas were outlined based on the "1,000 times" criteria.

❑ *Natural Biodegradation of Shallow Groundwater*

With the exception of two shallow monitoring wells, other shallow wells are generally clean of organic compounds. In addition, comparison of historical to recent data shows significant decreases in contaminant loadings over time at individual wells, and comparison of data from different wells over horizontal distance shows significant decrease in contaminant concentrations in the downgradient direction. Based on these data, it appears that essentially complete natural biodegradation of organic contaminants is occurring.

❑ *Deeper Aquifer*

Deeper groundwater quality reflects a different contaminant suite from the shallow zone. Although phenolics and cresols are present, BTX compounds were detected at elevated levels. These BTX compounds, not widely encountered in shallow groundwater and not associated with on-site activities, were detected in upgradient wells, as well as downgradient wells, indicating off-site sources.

DuPont recommends a phased approach to site remediation. Phase 1 would consist of a Remedial Action Work Plan focused on addressing contaminated soil areas. Phase 2 would consist of design and construction of a soil cover to eliminate the only significant exposure pathway, direct contact with site soils.

SECTION ONE

Introduction

1.1 SITE DESCRIPTION AND GEOGRAPHIC SETTING

The Pitt-Consol site consists of approximately 37 acres and is located in Essex County at 191 Doremus Avenue, Newark, New Jersey 07105. The facility ceased major manufacturing operations on May 23, 1983, and the entire facility was dismantled by January 1986. Site operations were primarily involved in the manufacture of alkylated phenols, particularly methyl phenol (cresol). The operations included an alkylation unit, a natural acid plant, a synthetic cresol plant, and several aboveground tank and drum storage areas.

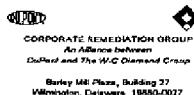
The site is located west of Doremus Avenue in Newark, New Jersey, adjacent to exit 15E of the New Jersey Turnpike (see Figure 1-1). The site is bordered on the south by the Nimco Company, to the west by Avenue P, the north by Roanoke Avenue, and to the east by Devino Brothers property. The site consists of Blocks 5016, Lot 1 and Block 5010, Lot 10. The closest surface water body is the Passaic River, located approximately 600 feet to the east of Doremus Avenue.

The Pitt-Consol site lies within an industrial zone along the Passaic River commonly referred to as the "ironbound section" of Newark because various rail lines enclose the area. Prior to site industrialization, the entire area was part of what was once referred to as the "Newark Meadows". By 1930, the site was no longer depicted as meadows or "meadow mat" on regional maps. Instead, it was covered with "historic fill" to allow development. A composite map, summarizing the fill areas and labeling the type of fill, indicates that the area upgradient from the Pitt-Consol site (west and north) was filled with industrial fill (see Figure 1-2 - modified from Zdepksi, 1987).

The closest residential zones are located more than 2,000 feet to the west. The ground surface is generally flat and covered primarily with stone and asphalt. There is little topographic relief over the site, generally less than 3 feet, with topographic highs in the northern end of the property and the topographic low in the southeast corner of the property. Drainage on the site is poor, with standing water collecting in some locations. Currently the site is unoccupied and fenced. Neither groundwater nor surface water in the area is used as a drinking water source. A petition to reclassify groundwater within the ironbound section of Newark from a potable Class II-A designation to a nonpotable Class-B Area was submitted (2B Environmental, 1997) but has since been rejected.

1.2 GEOLOGIC SETTING

The Pitt-Consol site is underlain by four major unconsolidated units which in turn overlie a reddish brown shale bedrock unit (Brunswick shale) at approximately 45 to 60 feet below ground surface. Unconsolidated units in ascending order (from bedrock to the surface) consist of a glacially derived silty clay confining unit; a fine to coarse water-bearing sand unit (referred to in this report as the deep aquifer); a semiconfining silty organic clay and peat layer (referred to in this report as peaty clay); and, finally, a heterogeneous, unconsolidated, water-bearing fill unit (referred to in this report as historic fill and the shallow water-bearing unit). Groundwater is often encountered within 1 foot of ground surface. Both water-bearing units apparently discharge to the Passaic River to the east.



SECTION ONE

Introduction

1.3 HISTORICAL INFORMATION

1.3.1 Industrial History and Past Production Processes

The Pitt-Consol site began industrial operations in the late 1800s. From the late 1800s until 1983, the facility manufactured road tar, cresols, phenols and cresylic acid. A summary of the industrial history, detailing dates and the industrial operator, is presented below.

- ❑ Late 1880s to 1955—Judson Butterworth, Inc./Reilly Tar and Chemical, Inc.
- ❑ 1955 to 1966—Pittsburgh Consolidated Coal Company (Pitt-Consol)
- ❑ 1966 to 1981—Pitt-Consol Chemical Company (owned by Conoco, Inc.)
- ❑ 1981 to 1983—Pitt-Consol Chemical Company (owned by DuPont)

Little information is available on production operations at the facility prior to its acquisition by Pitt-Consol in 1955. Operations at the site by Judson-Butterworth, Inc., and later Reilly Tar and Chemical, Inc., are reported to have included the manufacture of road tar and chemicals derived from coal processing such as phenols, cresols, and cresylic acid.

After the facility was acquired by Pitt-Consol in 1955, operations were upgraded and expanded. During this period, the plant processed various products related to coal and their derivatives. All production processes at the Pitt-Consol site were terminated in May 1983. Production facilities were dismantled by January 1986. The site is now inactive.

1.3.2 Previous Site Investigations

Since the dismantlement of the plant, a number of studies and environmental investigations have been conducted. Each of these investigations and a brief summary is listed below. Additional information about each investigation is provided in the report entitled *Preliminary Assessment—Pitt-Consol* [Corporate Remediation Group (CRG) 1998].

- ❑ *1985 Woodward Clyde Phase I Report (June 7, 1985)*
This investigation included an aerial photograph review, a terrain conductivity survey in the former lagoon area, the installation of 27 soil borings and seven shallow piezometers, groundwater sampling of all shallow wells, water level measurements, and soil sampling from four locations in the vicinity of the tar tank farms.
- ❑ *1985 Woodward Clyde Phase II Report (November 8, 1985)*
This investigation included the installation of seven shallow piezometers and one deep monitoring well, slug tests on 14 shallow wells, limited duration pump tests on four wells, a nonaqueous phase liquid (NAPL) study, two rounds of water level measurements, and groundwater sampling from all fifteen wells.
- ❑ *1986 Weston Hydrogeological Study*
This study included the installation of 13 shallow piezometers and three deep monitoring wells, limited duration pump tests at four well cluster pairs, groundwater sampling from four deep wells, and water level measurements.

SECTION ONE

Introduction

- ❑ *1986 Mittlehauser Coal Tar Waste Resource Recovery and Remediation Feasibility Evaluation (March 1987)*
For this study, 18 test pits were excavated in the vicinity of the former lagoons. Physical characteristics, metals, and organic analyses were performed. Results indicated that the material may not be suitable for use as a fuel supplement. Chemical analysis was also performed and indicated that the material has the typical composition of coal tars.
- ❑ *1987-1994 New Jersey Pollutant Discharge Elimination System (NJPDES) Groundwater Monitoring*
Groundwater monitoring began in 1987 and continued quarterly through 1994. Noncompliance with permit limitations were reported for each quarter. In February 1995, the facility's former Discharge to Groundwater (DGW) permit was determined by the New Jersey Department of Environmental Protection (NJDEP) to meet the NJPDES permit exemption criteria. Therefore, DuPont discontinued groundwater monitoring following the fourth quarter of 1994.
- ❑ *1989 CH2M Hill Summary of Existing Environmental Data*
This report summarized and provided a comprehensive data summary. Based on this information, conclusions were presented, along with discussion of the relationship between the Phase I aerial photograph interpretation and the results of the Mittelhauser study.
- ❑ *1992 CH2M Hill Site Investigation Summary and Report of Findings (February 1992)*
This investigation involved a well record search of wells within a 0.5-mile radius of the site, a tidal study, one additional well installation, the sampling of four deep wells and their corresponding shallow wells, and five surface soil samples from former tanks. Groundwater flow and average hydraulic conductivity was determined, and the lagoon boundary was delineated.
- ❑ *1995 USEPA Request for Info (Re: Diamond Alkali Superfund Site, Passaic River Study Area)*
In response to an Environmental Protection Agency (EPA) request for information, a document was prepared addressing issues such as site ownership, permits, manufacturing processes, and waste practices.
- ❑ *1996 Ashland Chemical Company (Re: Results of Hydro punch Ground Water Samples)(August 1995)*
In August 1995, 11 groundwater samples were obtained and analyzed for benzene. Samples were obtained between the southwest corner of the site along a linear line northeastward extending to just beyond the intersection of Foundry Street and Avenue P. Benzene concentrations ranged from 0.79 to 32 micrograms per liter (µg/L).

SECTION ONE

Introduction

1.4 OBJECTIVES AND SCOPE OF WORK

The objective of the SI/RI was to determine the nature and extent of soil and groundwater contamination from past manufacturing operations. Investigations were performed on the following media:

- ☐ On-site soil
- ☐ On-site groundwater
- ☐ On-site lagoons
- ☐ Off-site soil and groundwater

The on-site investigations involved sampling areas of concern (AOCs), including AOC 1—manufacturing/storage area, AOC 2—pitch storage and tar tank farm, and AOC 3—former lagoons. In addition, an on-site investigation of the former administration area was conducted. On-site groundwater was investigated by sampling existing monitoring wells, including six replacement wells. Figure 1-3 shows the locations of these AOCs and the former administration area.

Off-site soil and groundwater contamination were assessed through an evaluation of data collected from reviewing public files and assessing soil and groundwater contamination at the site perimeter. DuPont used data from the file review and perimeter investigation to determine whether subsequent phases of off-site investigation would be required.

SECTION TWO

On-Site Soil Investigation

2.1 OBJECTIVE AND APPROACH

The objectives of the on-site soil investigation were to determine the vertical extent of contamination, horizontally characterize physical and chemical properties of soils, and characterize potentially significant source areas. DuPont sampled and analyzed fill material, assessed the continuity and permeability of the peaty clay, and analyzed samples of peaty clay and the deeper clay overlaying the Brunswick Shale.

2.2 SAMPLING LOCATIONS

Ninety-four (94) soil borings and seven lagoon characterization borings were drilled. A map showing the AOCs, former administration area, and sampling locations is included as Figure 2-1. Figure 2-1 also shows the number and depth of samples that were collected at each boring, as well as the type of media sampled (i.e., soil versus lagoon material). Sampling results associated with each area of interest within AOCs are discussed in Appendix F.

The sampling locations were modified if rubble, asphalt, or concrete prevented soil sample collection. In such cases, the sample was relocated to the next closest area without surface obstructions that allowed sample collection. Sample locations also were moved to preferentially encounter potential contamination (e.g., discolored soil) based on visual evidence. Final sample locations were surveyed for the record and appear on Figure 2-1.

2.3 SAMPLING PROCEDURES

A direct-push sampling technology (Geoprobe®) was used to collect subsurface stratigraphic data, identify the biased fill and peaty clay sample depths, and collect soil samples. Each Geoprobe® sample was screened immediately using a photoionization detector (PID), and the reading was recorded. Upon completion of each boring, the boreholes were sealed using bentonite pellets. When the use of the Geoprobe® was limited by downhole conditions or produced insufficient sample volume, auger methods were used to obtain samples. When necessary, a hollow-stem auger drilling rig was used to collect three 3-inch inside diameter split-spoon samples ahead of the lead auger over 24-inch intervals. Each 2-foot long split-spoon sample was screened immediately using a PID, and the reading recorded.

A field geologist selected the peaty clay sampling interval for permeability testing by logging the Geoprobe® samples. Hollow-stem augers were used to drill to a point above the selected sample interval and Shelby tube samples were collected for laboratory permeability testing.

All sampling techniques were in accordance with the methods described in the 1992 NJDEP *Field Sampling Procedures Manual*.

SECTION TWO

On-Site Soil Investigation

2.4 SAMPLE COLLECTION AND ANALYSIS

A geologist performed field analyses (i.e., visual, and field instrument screening) on the material contained in the push-tubes and split-spoon samplers retrieved from the boreholes. The material was classified using the Unified Soil Classification System (USCS).

Soil samples from each boring location were submitted to a NJDEP-certified laboratory and were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), inorganic compounds, and metals (see Table 2-1). These analytical parameters were selected based on constituents associated with site activities. Table 2-2 provides a sampling summary that shows the relationship of each area of interest (listed by AOC) to boring locations and describes the number and type of samples collected.

2.5 EQUIPMENT DECONTAMINATION PROCEDURES

Sampling equipment was decontaminated in accordance with the 1992 NJDEP *Field Sampling Procedures Manual*. Drilling rigs were steam-cleaned thoroughly or manually scrubbed after initial arrival on-site and between drilling locations. Large equipment and machinery were steam-cleaned at a temporary decontamination pad. Small equipment (e.g., hand augers, split-spoons, trowels) was decontaminated at the edge of the exclusion zone.

All decontamination fluids and wastes were containerized for characterization and proper disposal. The outside of all sample containers was decontaminated prior to packaging.

2.6 DESCRIPTION OF SOIL

Soil borings showed that the site is completely covered by a heterogeneous fill layer (historic fill) consisting of silty clay, gravel, cinders, brick, and wood fragments. The fill varies in thickness from 2 to 18 feet (see Figure 2-2) but typically ranges from 6 to 8 feet. A natural peaty clay layer (also known as "meadow mat") underlies the fill.

The peaty clay varies in thickness from 2 to 26 feet (see Figure 2-3) with the peaty clay unit thinning toward the western edge of the site. In four borings (F05-01, I03-01, I05-01, and K06-01) peaty clay samples were not obtained even though drilling techniques were changed to hollow-stem auger methods in an attempt to sample the peaty clay unit. Thirteen shelly tube samples were collected at various locations from depths selected to encounter the peaty clay. Laboratory permeability tests were conducted on these samples. Test results indicated that 11 of the shelly tubes yielded peaty clay (fill was collected inadvertently in the other two tubes) and the hydraulic conductivity of the samples ranged from 8×10^{-6} to 8×10^{-8} centimeters per second (cm/sec). Geotechnical results in summary and individual format are presented in Appendix A.

The deeper sand aquifer underlies the peaty clay and consists of medium to coarse red sand. Five borings were drilled through the sand and into the deep clay. The 5 borings were located at each corner and in the middle of the site. These borings plus monitoring well logs indicated that the sand is 8 to 20 feet thick. Beneath the sand is a red glacial clay that transitions to bedrock (Brunswick Shale) with increasing depth.

Boring logs are presented in Appendix B.

SECTION TWO**On-Site Soil Investigation****2.7 ANALYTICAL RESULTS**

Field data and analytical results for the former administration area and AOCs 1, 2, and 3 were reviewed and evaluated. Data for these areas are presented in Appendix C with constituent concentrations that exceeded New Jersey Non-Residential Direct Contact Soil Cleanup (NRDCSC) criteria bracketed. Appendix D, Figures D-1 through D-12 show the data as concentrations expressed in milligrams per kilogram (mg/kg) and provide color-coded symbols that represent the degree of NRDCSC exceedances expressed in multiples of the criteria (e.g., 10 times the criteria, 100 times the criteria, etc.). These figures were developed for each analyte whose concentration exceeded NRDCSC criteria for at least 13 sample locations (see Table 2-3 showing analytes mapped as a function of number of analytical “hits”). Appendix D, Figures D-13 through D-24 show perimeter sample locations with color-coded symbols that represent the degree of Residential Direct Contact Soil Cleanup (RDCSC) criteria exceedances. Table 2-4 shows analytical “hits” and exceedances of RDCSC criteria for perimeter samples only. Sampling results associated with each area of interest within AOCs are discussed in Appendix F.

2.7.1 Former Administration Area

Soil samples from within this area (L15-01) and on the perimeter (J16-01 and M16-01) were generally clean with respect to site-related organic contaminants as compared to New Jersey Nonresidential Direct Contact Soil Cleanup (NRDCSC) criteria. The surficial fill samples from ground level (0 to 2 feet) and 4 to 6 feet below ground surface (BGS) at boring M16-01 showed a few polynuclear aromatic hydrocarbon (PAH) compounds that only slightly exceeded criteria. All three sample locations also indicated exceedances for arsenic, copper, lead, and zinc. Metals exceedances appeared typical of the entire site and probably are characteristic of historic fill in this region (see Table 2-5). The samples of peaty clay and the one sample of the deeper clay from boring M16-01 showed no exceedances of the NRDCSC criteria. Peaty clay and deep clay samples from perimeter boring M16-01 also showed no exceedances of New Jersey Residential Direct Contact Soil Cleanup (RDCSC) criteria.

2.7.2 AOC 1—Manufacturing/Storage Area

Soil samples were collected from 55 locations within this AOC. Of that total, 16 boring locations were sampled at three different depths: surficial (0 to 2 feet), 2-foot interval near the base of fill (between 4 and 10 feet BGS), and underlying peaty clay (1 to 3 feet below the top of the unit). One boring (G11-01) was advanced to collect a fourth sample from the deep clay and G08-02 was pushed near former lagoon F to provide a single lagoon sample. The remaining 37 borings were logged and screened to identify the “worst case” interval within the fill, and a discrete sample was collected from that interval.

Samples from the fill unit showed significant contamination with PAH compounds. Eight of the 16 PAH compounds analyzed for were found consistently exceeding their respective NRDCSC. These were benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; dibenzo(a,h)anthracene; indeno(1,2,3-cd)pyrene; and naphthalene. Only one VOC, benzene, was detected in fill samples from a few locations at concentrations exceeding the

SECTION TWO

On-Site Soil Investigation

NRDCSC of 13 ppm. Appendix D, Figures D-4 to D-12 show the areal distribution of the PAH compounds and VOCs and their relative concentration as multiples of nonresidential criteria.

An area near former lagoon F had elevated concentrations of multiple PAH compounds. Total PAH concentrations in this area ranged from 31,000 to 70,400 mg/kg. NAPL was not observed in this area; however, a tar-like material was present at sample location G08-02.

In addition to organics, arsenic, lead, and zinc were found in random samples both at the surface and near the bottom of the fill at concentrations in excess of the NRDCSC. As mentioned previously, these metal concentrations appear to be typical of historic fill in this region.

Samples from the underlying peaty clay layer, in general, had fewer PAH compounds reported and at lower concentrations than the fill unit above (see Appendix D, Figures D-4 to D-12). Since the peaty clay has a relatively impermeable nature (see Appendix A), the presence of PAH compounds at significantly lower concentrations, probably is an artifact of sampling methodology. Geoprobe® samplers may carry more mobile organic contaminants downward with the plastic inner sleeve, thus cross-contaminating the deeper unit. The metals characteristic of the historical fill layer (i.e., arsenic, lead, zinc) were not detected in peaty clay samples at concentrations exceeding the NRDCSC.

One deep clay sample (G11-01) showed no contamination above the NRDCSC.

2.7.3 AOC 2—Pitch Storage and Tar Tank Farm

Soil samples were collected from 18 locations within this AOC, with three samples per location at the following three depths: surficial (0 to 2 feet), 2-foot interval near the base of fill (between 4 and 10 feet BGS), and underlying peaty clay (1 to 3 feet below the top of the unit). Reported results for AOC 2 fill samples had various SVOC contaminants above NRDCSC, primarily PAHs. Only one VOC, benzene, was detected in fill samples from a few locations at concentrations exceeding the NRDCSC of 13 ppm. The contaminants are similar to those reported from soil samples collected in AOC 1 sampling locations.

In addition to organics, arsenic, lead, and zinc were found in random samples both at the surface and near the bottom of the fill at concentrations in excess of the NRDCSC ranging up to 10 times the criteria (see Appendix D, Figures D-1, D-2, and D-3). As discussed previously, these metals appear to be typical of historic fill in this region.

The samples of peaty clay had results reported in exceedance of the NRDCSC, but to a lesser degree. Appendix D, Figures D-4 through D-12 show the data as concentrations expressed in mg/kg and provide color-coded symbols that represent the degree of NRDCSC exceedances. Some locations (borings A08-01, A10-01, and B09-01) showed evidence of a residual NAPL. As described in Section 2.7.2 above, peaty clay contaminant concentrations may be an artifact of sampling methodology.

A deep clay sample from within AOC 2 (A13-01) showed no contamination above the NRDCSC.

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On-Site Soil Investigation

2.7.3 AOC 3—Former Lagoons

Soil samples were collected from 20 locations within this AOC with three samples per location at the following three depths: surficial (0 to 2 feet), 2-foot interval near the base of fill (between 4 and 10 feet BGS), and peaty clay (1 to 3 feet below the top of the peaty clay unit). Reported results for AOC 3 fill samples had various SVOC contaminants above NRDCSC, primarily PAHs. Only one VOC, benzene, was detected in fill samples from a few locations at concentrations exceeding the NRDCSC of 13 ppm. The contaminants are similar to those reported from soil samples collected in AOC 1 and 2 sampling locations.

In addition to organics, arsenic, lead, and zinc were found in random samples both at the surface and near the bottom of the fill at concentrations in excess of the NRDCSC generally ranging up to 10 times the criteria (see Appendix D, Figures D-1, D-2, and D-3). One surficial fill sample (E02-01), had a lead concentration between 10 and 100 times the criteria. As discussed previously, these metals appear to be typical of historic fill in this region.

Two deep clay samples within AOC 3 (B01-01 and J02-01) showed no contamination above the NRDCSC.

In addition to the 20 soil boring locations, discrete samples were collected from six borings located to encounter material from former lagoon areas within AOC-3. Analytical results from these borings are discussed in Section 4.

2.8 POTENTIALLY SIGNIFICANT SOURCE AREAS

A practical definition of source area has been developed for use in identifying areas that may require attention because of their potential contribution to groundwater contamination. Inherent in any such definition is a cause, ie, contaminated soil mass, and effect, ie, contaminated downgradient groundwater. Inspection of the analytical data suggests that a sample with any contaminant concentration in excess of 1,000 times the relevant criteria (NRDCSC or RDCSC criteria) should be considered a candidate for inclusion in a potentially significant source area. However, since the definition includes two components, the data also must show an exceedence in groundwater for that same contaminant in a monitoring well near the downgradient property line. Hence, the definition of potentially significant source area for the Pitt-Consol site is as follows.

- ❑ Concentration in soil of any contaminant in excess of 1,000 times the relevant criteria; AND,
- ❑ Same contaminant concentration in downgradient monitoring well near property line in excess of 10 times the NJ Class IIA groundwater standard.

Based on this definition, no potentially significant source areas were identified on the site. However, in order to facilitate redevelopment of the site, DuPont proposes to address areas based solely on a single soil contaminant exceedence in excess of 1,000 times the relevant criteria.

SECTION THREE

On-Site Groundwater Investigation

3.1 OBJECTIVE AND APPROACH

The objectives of the on-site groundwater investigation were to provide a comprehensive characterization of groundwater quality and identify potential migration pathways for groundwater quality constituents. DuPont installed replacement wells, measured water levels and sampled monitoring wells for chemical analysis. DuPont used these data to qualitatively estimate groundwater flow direction, contaminant transport and potential for off-site impacts.

3.2 MONITORING WELL SURVEY AND EVALUATION

Existing monitoring wells were located in the field and evaluated with respect to usability. Each well was sounded and the depth compared to well construction logs. Wells that could not be located or could not yield representative groundwater samples were replaced with new wells (PD-1 and P-12). Damaged wells requiring replacement were abandoned in accordance with the 1992 *Field Sampling Procedures Manual* (P-6, P-7, PD-7, P-13 and P-14). All monitoring wells were sampled and analyzed for analytes shown on Table 2-1, including a library search for the VOC and SVOC analytical suite on work plan-specified, replacement monitoring wells PD-1, P-7, PD-7, and P-13.

3.3 MONITORING WELL INSTALLATION

Seven new monitoring wells were constructed to replace previously destroyed or inaccessible wells. The monitoring wells were constructed at the locations of former wells PD-1, P-6, P-7, PD-7, P-12, P-13 and P-14. The shallow well replacements at locations P-6, P-7, P-12, P-13 and P-14 were screened in the fill unit above the peaty clay and provided groundwater quality and water level control. The deeper monitoring well replacements at locations PD-1 and PD-7 were screened in the lower sand aquifer underlying the peaty clay.

Replacement wells were drilled using a hollow-stem auger drill rig. The wells were constructed of 2-inch polyvinyl chloride (PVC) casing with sufficient factory-slotted PVC well screen positioned to span the water bearing unit or aquifer. A sand pack was employed, and hole plug was placed on top of the sand pack to prevent grout from entering the pack. Wells were drilled, completed, and developed according to specifications defined by the 1992 *Field Sampling Procedures Manual*. Monitoring well logs appear in Appendix B.

To minimize the potential for cross-contamination between water bearing units during deep well installation, an outer casing was set to isolate shallow groundwater prior to drilling through the peaty clay confining unit.

Existing and replacement monitoring wells were redeveloped using centrifugal pumps. All monitoring wells also were purged of three to five well volumes using centrifugal pumps. Groundwater samples were collected at least two weeks after purging using low-flow bladder pumps.

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On-Site Groundwater Investigation

3.4 SAMPLING PROCEDURES

Sampling of all monitoring wells was conducted in accordance with the procedures described in the NJDEP's May 1992 *Field Sampling Procedures Manual*. A New Jersey certified laboratory provided the pre-preserved sample containers, coolers, and chain-of-custody forms. Chain-of-custody procedures were provided in Appendix B of the work plan. Samples were shipped to Lancaster Laboratories for analysis.

3.4.1 Water-Level and Free-Product Measurements

After initial removal of the well cap at each location, the well headspace was screened using a calibrated PID, and the results were recorded. Well-cap removal and well-casing access were conducted in accordance with the site health and safety plan (HASP). The HASP was provided in Appendix C of the work plan.

Before each well was purged, water level and total well depth were measured and recorded for use in calculating well volumes. All measurements were referenced to the surveyor's mark located at the top of the inner casing and were recorded to the nearest 0.01 foot. An oil-water interface probe was used to test for the presence of immiscible fluids (i.e., free product), and the results were recorded. No free product was detected in any site monitoring well.

3.4.2 Well Evacuation

Bladder pumps [rated from 0.1 to 24 liters per minute (L/min)] were used to purge and sample the wells. Field parameters consisting of temperature, pH, specific conductance, redox, dissolved oxygen, and turbidity were monitored and recorded during purging (at a minimum, after purging a well volume). Sampling began after stabilization of these parameters. Stabilization was reached when three consecutive sets of field readings collected in three-minute intervals were within 10 percent of each other. Purge water was discharged to the ground at a distance where subsequent recharge did not affect sample integrity. Purge water from deeper monitoring wells and shallow well P-10 (due to historically elevated benzene levels) was collected and containerized for disposal to avoid cross-contamination of shallow groundwater. All equipment was decontaminated properly after use at each well using procedures outlined in Section 3.6.

3.5 SAMPLE COLLECTION AND ANALYSIS

Groundwater samples were collected directly from the discharge tubing of the low-flow bladder pump at a reduced flow rate [no greater than 100 to 250 milliliters per minute (ml/min)]. Field sample measurements for pH, temperature, specific conductivity, redox, dissolved oxygen, and turbidity were collected immediately following sample collection and recorded in the bound log book. Recorded field parameter readings are listed with laboratory data in Appendix E. Samples were placed in coolers on ice immediately following sample collection.

All samples sent to the laboratory were analyzed for VOCs, SVOCs, inorganic compounds, metals and miscellaneous parameters (see Table 2-1). Groundwater quality results were

SECTION THREE

On-Site Groundwater Investigation

compared to previous analytical results (see historical monitoring well data in Appendix E) and analysis was performed to provide a comprehensive characterization of groundwater quality. In addition, piezometric maps were prepared for the shallow groundwater and deep aquifer to estimate groundwater flow direction.

3.6 EQUIPMENT DECONTAMINATION PROCEDURES

The following procedures were followed for pump decontamination:

- ☐ Wash with Alconox® detergent and tap water (surface).
- ☐ Rinse with tap water (surface).
- ☐ Rinse with pesticide-grade hexane or methanol.
- ☐ Rinse with acetone (pesticide-grade).
- ☐ Rinse with distilled and deionized (ASTM Type II) water.
- ☐ Total air dry.

3.7 GROUNDWATER FLOW

3.7.1 Shallow Groundwater

A piezometric map of the shallow water bearing unit, based on water levels measured in the 10 shallow monitoring wells (constructed in the surficial fill), is shown on Figure 3-1. This map shows groundwater flow generally from northwest to southeast toward the Passaic River. The groundwater gradient was estimated at 0.0025. Based on an estimated hydraulic conductivity for historic fill of 1.2×10^{-1} cm/sec (Woodward-Clyde Consultants 1985), the average groundwater velocity was calculated at 0.18 feet/day. Shallow groundwater flow is influenced by city sewer lines that run across the northern part of the site parallel to the former Roanoke Avenue. These lines and surrounding backfill appear to act as a sink to shallow groundwater, causing flow lines to deflect toward the sewer lines. Tidal effects of the nearby Passaic River have no impact on gradient or flow direction at the site.

3.7.2 Deeper Sand Aquifer

A piezometric map of the deep water bearing unit, based on water levels measured in the five deep monitoring wells (constructed in the deeper sand aquifer), is shown on Figure 3-2. This map shows groundwater flow primarily west to east toward the Passaic River. The groundwater gradient for the deeper aquifer is estimated at 0.002. Flow rates are estimated at 0.002 feet/day. Tidal effects of the nearby Passaic River have little impact on gradient and no impact on flow direction in the deeper aquifer at the site.

SECTION THREE

On-Site Groundwater Investigation

A comparison of groundwater head between the shallow groundwater and deep aquifer shows a slight net downward head. These head differences indicate that the intervening peaty clay is an effective barrier to flow and vertical migration.

3.8 ANALYTICAL RESULTS

On-site groundwater field data and analytical results for the shallow fill and deeper sand aquifer were reviewed and evaluated in conjunction with results obtained from previous sampling rounds collected between 1985 and 1995. These data are presented in Appendix E with constituent concentrations that exceeded New Jersey Class IIA groundwater standards bracketed.

3.8.1 Shallow Groundwater

Fourteen monitoring wells were sampled as part of the on-site shallow groundwater investigation. Results indicated that arsenic and lead were randomly distributed and exceeded New Jersey Class IIA groundwater standard criteria in P-1, P-2, P-3, P-5, P-6, P-7, P-10, and P-12. Manganese is present above criteria in all of the aforementioned wells.

Monitoring wells P-6 and P-10, located within potential source areas, exhibited PAH, benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations that exceed the criteria. Other shallow monitoring wells, including P-11S near former lagoon F, generally were clean of organic contaminants, with the exception of the presence of 2,4-dimethylphenol.

Figure 3-3 shows the data expressed in milligrams per liter (mg/L) with brackets showing exceedance of New Jersey Class IIA groundwater standard criteria. Detected concentrations of contaminants without Class IIA criteria are listed on data tables included in Appendix E.

Figures 7-3 through 7-12 show organic concentrations (mostly PAHs) in monitoring wells plotted against distance from upgradient monitoring well locations. Each figure shows concentration decreases with distance and projects that concentrations would be within New Jersey Class IIA groundwater standard criteria at the downgradient property line. In addition, Figures 7-13 through 7-18b show those same organic contaminants plotted against time for monitoring wells P-1, P-2, P-5, P-7, P-10 and P-11S. These plots indicate a significant concentration decrease over the time period 1987 through 1999. The distance and time plots considered together indicate that natural biodegradation is a rapid process at this site and is responsible for shallow groundwater quality improvement.

Evaluation of groundwater quality parameters that are indicators of biological degradation (e.g., dissolved oxygen (DO), methane, and sulfate) tend to support intrinsic bioremediation as a contributing mechanism to natural attenuation. For example, biological degradation of organic compounds in aerobic conditions will decrease dissolved oxygen and as biological activity progresses to an anaerobic state, methane is generated (see Figure 3-3). The above mentioned figure indicates that DO is suppressed where significant organic contamination is found in groundwater (wells P-6 and P-10) and DO concentrations rebound with increasing distance from biologically active source areas. Likewise, methane concentrations are highest where oxygen is depleted (wells P-3, P-6, P-7, P-11S and P-13) and anaerobic conditions may exist, and lower at increasing distance from source areas (wells P-4 and P-9)

SECTION THREE

On-Site Groundwater Investigation

3.8.2 Deeper Sand Aquifer

Five monitoring wells were sampled as part of the on-site deeper sand aquifer investigation. Results indicated that manganese (for all deep monitoring wells) and arsenic (in PD-1, PD-2, and PD-11) were present above the New Jersey Class IIA groundwater standard criteria.

Both upgradient and downgradient perimeter monitoring wells (PD-2, PD-5, PD-1, and PD-7) and the deep monitoring well in the center of the site near former lagoon F (PD-11) exceeded the criteria for BTX compounds; 2,4-dimethylphenol; and phenol. Chlorobenzene was detected at concentrations in excess of Class IIA groundwater standard criteria only at PD-1 and PD-11.

Figure 3-4 shows the data expressed in mg/L with brackets showing exceedance of New Jersey Class IIA groundwater standard criteria. Detected concentrations of contaminants without Class IIA criteria are listed on data tables included in Appendix E.

Characteristic quality of deep groundwater was distinctively different from shallow groundwater quality. For example, deeper groundwater was about 5 degrees F cooler than shallow groundwater. Benzene, toluene and xylene were detected both in upgradient and downgradient deep well samples, indicating potential off-site sources of these contaminants. These volatile organic chemicals were not widely detected in shallow monitoring well samples. PAH concentrations, characteristic of shallow groundwater quality, were only detected at one deep monitoring well (PD-2) and at significantly lower levels than levels generally detected in shallow monitoring wells.

SECTION FOUR

On-Site Former Lagoon Investigation

4.1 OBJECTIVE AND APPROACH

The objective of the on-site lagoon investigation was to determine if residual lagoon materials are a potentially significant source of groundwater contamination. The residual lagoon materials were sampled for characterization.

4.2 LAGOON SAMPLING LOCATIONS

One representative sample was collected from each of the former lagoons (see Figure 2-1). The borings were located in areas that intersect the most lagoon material based upon the observations made in the investigation conducted by CH2M Hill in 1992 and the NJDEP's site inspection in December 1998.

4.3 SAMPLING PROCEDURES

A Geoprobe® was used to collect lagoon samples. Each sample was screened immediately using a PID, and the reading was recorded.

All sampling techniques were in accordance with the methods described in the 1992 NJDEP *Field Sampling Procedures Manual*. Solid wastes that were generated at these locations were placed in drums or other appropriate containers and managed as described in Section 9 of the work plan.

4.4 SAMPLE COLLECTION AND ANALYSIS

A geologist recorded field observations (i.e., visual, olfactory, and field instrument measurements) on the material contained in the push-tubes or split-spoon samplers retrieved from the boreholes. Lagoon samples were collected with stainless-steel sampling equipment, placed in suitable containers, and submitted for analysis at Lancaster Laboratories.

4.5 EQUIPMENT DECONTAMINATION PROCEDURES

Sampling equipment was decontaminated in accordance with the 1992 NJDEP *Field Sampling Procedures Manual*. Drilling rigs were steam-cleaned thoroughly or manually scrubbed after initial arrival on-site and between drilling locations. Large equipment and machinery were steam-cleaned at a temporary decontamination pad. Small equipment (e.g., hand augers, split-spoons, trowels) was decontaminated at the edge of the exclusion zone.

All decontamination fluids and wastes were containerized for characterization and proper disposal. The outside of all sample containers was decontaminated prior to packing for shipment to the lab.

SECTION FOUR

On-Site Former Lagoon Investigation

4.6 ANALYTICAL RESULTS

Field data and analytical results for the on-site former lagoon investigation were reviewed and evaluated in conjunction with results obtained from previous investigations. Results indicated that lagoon materials were present in borings C02-01, E02-02, G03-02, I03-02, J07-01, and M09-01. All materials encountered had the consistency of hardened tar, with the exception of sample J07-01, which was described as filter cake. The presence of lagoon materials at these sampling locations was consistent with the findings of the test pit investigation conducted by CH2M Hill in 1992. Total PAH concentrations in the samples ranged from 1,100 to 83,000 mg/kg. Only two samples, C02-01 (within the footprint of former lagoon A) and E02-02 (within the footprint of former lagoon B) had total PAH concentrations much higher than fill samples from nearby soil boring locations. The concentrations were 41,000 mg/kg and 83,000 mg/kg respectively. PAH concentrations for fill samples from nearby borings typically ranged up to 35,000 mg/kg. Therefore, total PAH concentrations of most of the lagoon samples were similar to total PAH concentrations of nearby soil (fill) samples. Analytical data from lagoon samples are presented in Appendix C.

SECTION FIVE

Off-Site Soil and Groundwater Investigations

5.1 OBJECTIVE AND APPROACH

The objective of the off-site soil and groundwater investigation was to determine the nature and potential sources of off-site contamination. A literature review was performed and data collected from reports [through a Freedom of Information Act (FOIA) request] regarding previous and ongoing soil and groundwater investigations on adjacent properties. In addition, DuPont assessed off-site contamination by evaluating the data from the perimeter investigation.

5.2 LITERATURE REVIEW AND FOIA DATA

DuPont retained Latham and Watkins to conduct a literature review to determine ownership history and historical use of properties proximal to the DuPont Pitt-Consol site. Documents were obtained through FOIA requests with various state agencies. In addition, aerial photographs and Sanborn Insurance Maps were reviewed. A report summarizing these findings is contained in Appendix G.

5.3 PERIMETER INVESTIGATION

As part of the SI/RI, DuPont drilled 17 Geoprobe® borings at the perimeter of the site to collect samples from the surface fill, base of fill, and the peaty clay for complete laboratory analysis. Four of the 17 boreholes extended to the lower confining clay, with samples collected for complete laboratory analysis. Groundwater monitoring wells, 12 of which are located at or near the site perimeter, were also sampled and analyzed.

5.4 RESULTS

5.4.1 Literature Review and FOIA Data

The Latham and Watkins study found that the DuPont Pitt-Consol facility was surrounded by facilities of varying size and shape, primarily consisting of oil, gas and solvent refineries, plants and factories (see Figure 5-1). The area upgradient (north and northwest) of the site has an extensive history of production of creosote, roofing tar, coatings and felts, solvents, paints, and lacquers. Within a one-mile radius of the site there were 365 hazardous waste sites identified in a 1995 ERIIS survey. Contaminants associated with the processes listed above include the same constituents that are found in media at the Pitt-Consol site. In an area with a complex industrial history such as the Ironbound, problems of delineation and remediation are compounded by the history of property abandonment and illegal hazardous waste dumping. Therefore, due to the significant number of contamination sources, the industrial filling of the area, the fact that the primary COCs at the site are commonly found in asphalt roadways and macadam (which surround the site), and the existence of multiple upgradient sites with similar constituents of concern, DuPont feels that additional efforts to delineate constituents to residential soil criteria offsite are unwarranted.

SECTION FIVE

Off-Site Soil and Groundwater Investigations

5.4.2 Perimeter Investigation

Perimeter soil boring samples from the fill showed contaminants and concentrations characteristic of surficial soils in the adjacent AOCs. In other words, perimeter samples adjacent to AOC 2 and AOC 3 showed contamination with BTX-type compounds and PAHs. Perimeter samples from the easternmost portion of AOC 1 and the former administration area did not show contamination from these chemicals. Appendix D, Figures D-13 through D-24 show perimeter sample locations with color-coded symbols that represent the degree of Residential Direct Contact Soil Cleanup (RDCSC) criteria exceedances. Table 2-4 shows analytical “hits” and exceedances of RDCSC criteria for perimeter samples only.

Perimeter groundwater samples from the shallow fill tended to mirror perimeter soil sample results. Shallow well samples from the perimeter of AOCs 2 and 3 showed elevated levels of BTX compounds, PAHs, cresol, and phenol. Shallow well samples from the eastern perimeter of AOC 1 and the former administration area generally were clean compared to New Jersey Class IIA groundwater standard criteria.

Perimeter samples from deep monitoring wells adjacent to AOC 2 and AOC 3 (generally upgradient) showed elevated levels of chlorobenzene; benzene; toluene; xylene; 2,4-dimethylphenol; and phenol. Perimeter samples from downgradient deep monitoring wells, PD-1 and PD-7 (for some compounds), showed similar contamination. Deeper monitoring wells did not show elevated PAHs except for PD-2, which is located in an area where the confining peaty clay unit is thin or possibly absent. PAH levels at PD-2 were much lower than those found in nearby shallow monitoring wells.

SECTION SIX

Quality Assurance and Quality Control

The following quality assurance and quality control (QA/QC) samples were collected during the sampling events (see Appendix B of work plan for further definition of QA/QC samples):

- ☐ Field duplicate samples
- ☐ Trip blanks (laboratory-sealed) to accompany each sample shipping container that contained VOC analysis containers
- ☐ Equipment blanks for each day of sampling
- ☐ Matrix spike samples and matrix spike duplicate samples

Equipment blanks were obtained at a rate of one per day by pouring laboratory-supplied American Society for Testing and Materials (ASTM) Type II distilled/deionized water over the sampling equipment and transferring the water into sample containers. The blank sample was shipped with the other samples collected that day. All QA/QC sampling indicated that the resultant data were of adequate quality.

Samples and chain-of-custody forms were placed in coolers with the original bottles, packed in wet ice, and sealed for custody purposes. The laboratory chain-of-custody forms were used to document sample possession and the requested analytical parameters. Samples were shipped to the laboratory by a courier provided by the laboratory or overnight shipping.

SECTION SEVEN

Conclusions and Recommendations

7.1 CONCLUSIONS

During this SI/RI, 204 soil samples, seven lagoon characterization samples, and 19 groundwater samples were collected and analyzed. In addition, 13 permeability tests were conducted, seven replacement monitoring wells were installed, groundwater levels were measured in monitoring wells, and an off-site file search was conducted. DuPont's assessment of these data plus previous data and information (see the *Preliminary Assessment—Pitt-Consol*; CRG 1998) resulted in the conclusions listed below.

❑ *Site Characterization Complete*

Data from over 200 samples coupled with information gleaned from 10 years worth of previous investigations were adequate to accomplish study objectives and facilitate site reuse via our presumptive remedy -- engineered soil cover. Additional efforts to delineate constituents to residential soil criteria offsite are unwarranted because primary COCs at the site are commonly found in asphalt roadways and macadam (which surround the site) and at neighboring properties.

❑ *Vertical Extent of Soil Contamination*

Despite some exceedances of the NRDCSC criteria in the peaty clay layer, this layer appears to be an effective barrier (hydraulic conductivity ranging from 8×10^{-06} to 8×10^{-08} cm/sec -- see Appendix A) to vertical migration and is therefore considered the vertical extent of contamination. In AOC 3, where the peaty clay layer is less than 2 feet or possibly absent, contamination may extend to the deeper sand aquifer. Random exceedances in some samples from the peaty clay layer probably are a result of sampling method cross-contamination (i.e., "dragging" contamination downward with sampling probe rather than vertical infiltration).

❑ *Significant Source Area(s)*

A practical definition of source area has been developed to identify and assess contaminated areas that potentially require mitigation. The definition below was used to outline such areas and determine the depths of concern. An area was considered a potentially significant source if the following conditions were met.

- Presence of at least one contaminant at a concentration of more than 1,000 times it's relevant criteria; *and*
- Presence of that same contaminant in groundwater (as detected in monitoring well(s) near the downgradient property line) at a concentration more than 10 times the New Jersey Class IIA groundwater standard criteria.

Based on the definition above, no potentially significant source areas were identified on the site.

SECTION SEVEN

Conclusions and Recommendations

☐ *Areas to Address in RAWP*

In order to facilitate redevelopment of the site, DuPont proposes to address areas characterized solely by a single soil contaminant exceedence in excess of 1,000 times the relevant criteria. Five such areas (see Figure 7-1) were outlined based on the "1,000 times" criteria.

☐ *Natural Biodegradation of Shallow Groundwater*

With the exception of shallow monitoring wells P-10 (located within the footprint of former lagoon C) and P-6 (located adjacent to a former tar tank area), other shallow monitoring wells are generally clean of organic compounds. In addition, comparison of historical to recent data shows significant decreases in contaminant loadings over time at individual wells. Based on these data, it appears that extensive natural biodegradation of organic contaminants is occurring.

☐ *Deeper Aquifer*

Deeper groundwater quality reflects a different contaminant suite from the shallow zone. Although phenolics and cresols are present, BTX compounds were detected at elevated levels. These BTX compounds, not widely encountered in shallow groundwater and not associated with on-site activities, were detected in upgradient wells, indicating off-site sources.

7.2 RECOMMENDATIONS

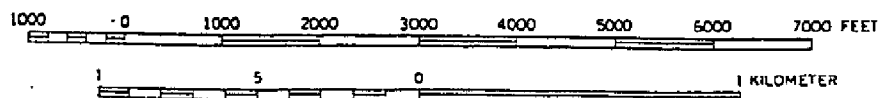
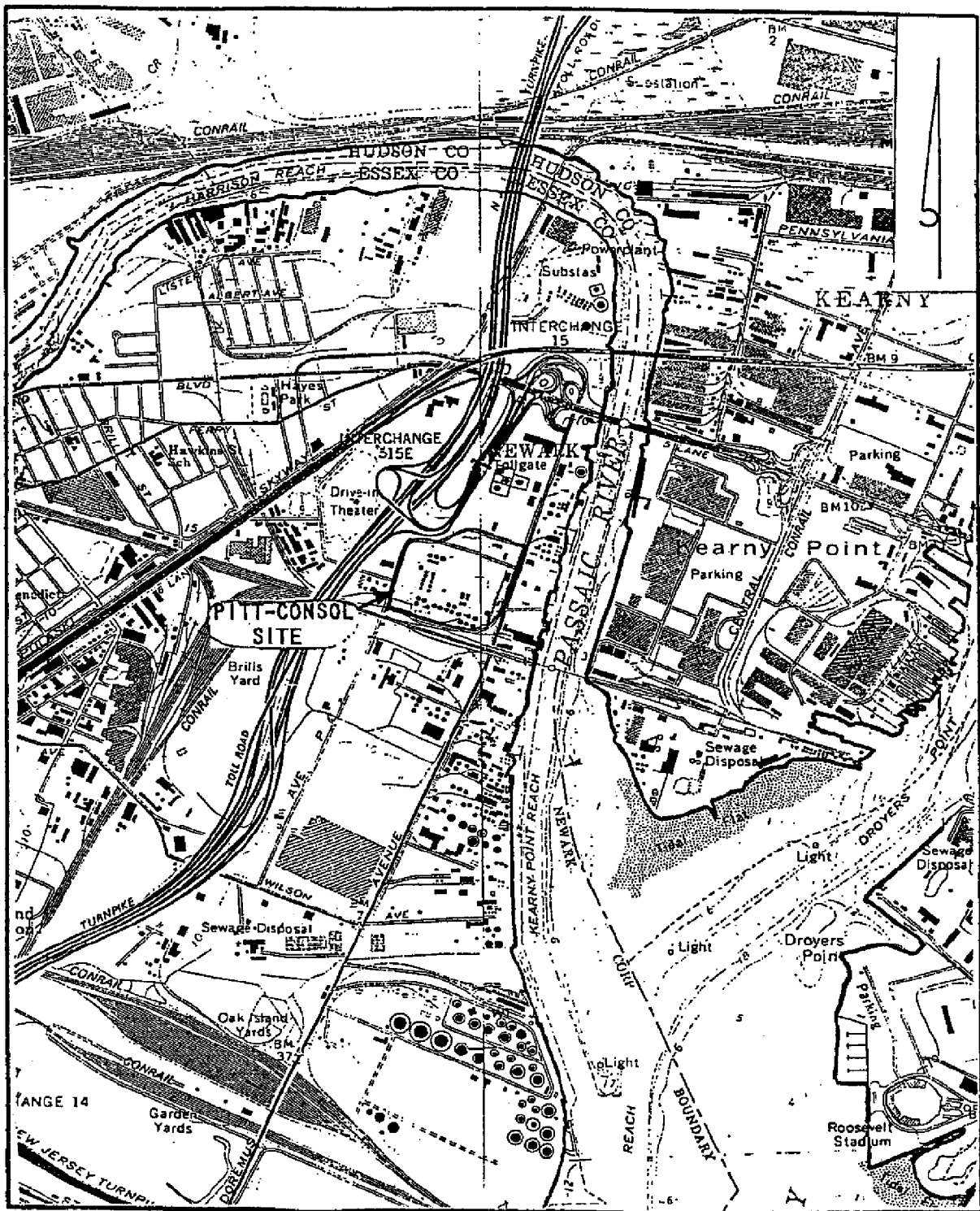
DuPont recommends a phased approach to site remediation. Phase 1 would consist of a Remedial Action Work Plan (RAWP) focused on addressing soil areas outlined on Figure 7-1. Phase 2 would consist of design and construction of a soil cover to eliminate the only significant exposure pathway, direct contact with site soils.

SECTION EIGHT

References

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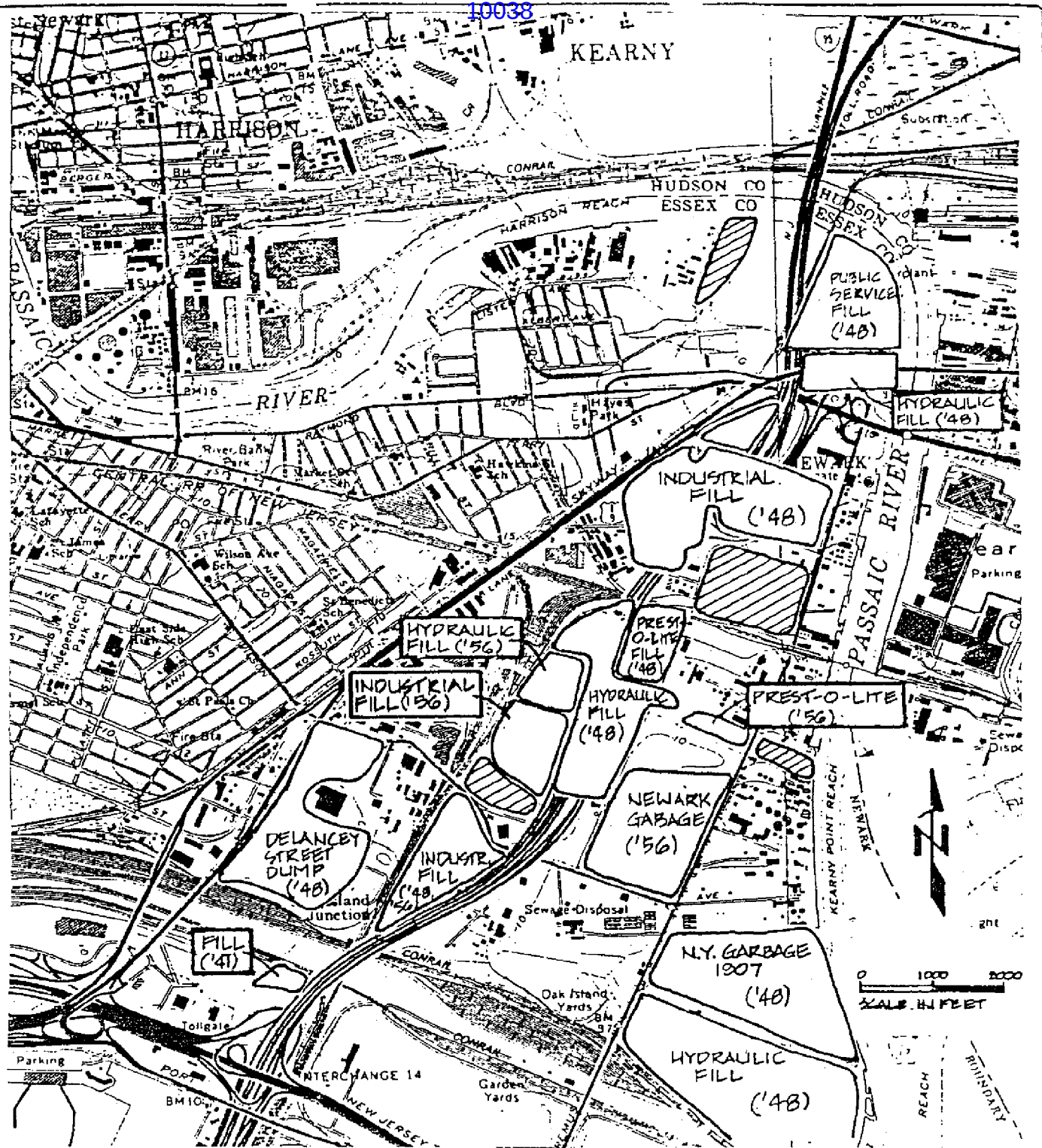
FIGURES



REGIONAL LOCATION PLAN

Figure 1-1

10038



FILL AREAS LABELED AS TYPE AND YEARS NOTED. BUSINESSES SHOWN IN HACHURE WERE LABELED ON MAPS

SOURCE: THREE FILE MAPS, SCALE 1"=400', OFFICE OF ESSEX CO. MOSQUITO CONTROL

J.MARK ZDEPSKI, INC.

FEDERATED METALS

Figure 1-2
Fill Location Map
From Zdepski (1987)

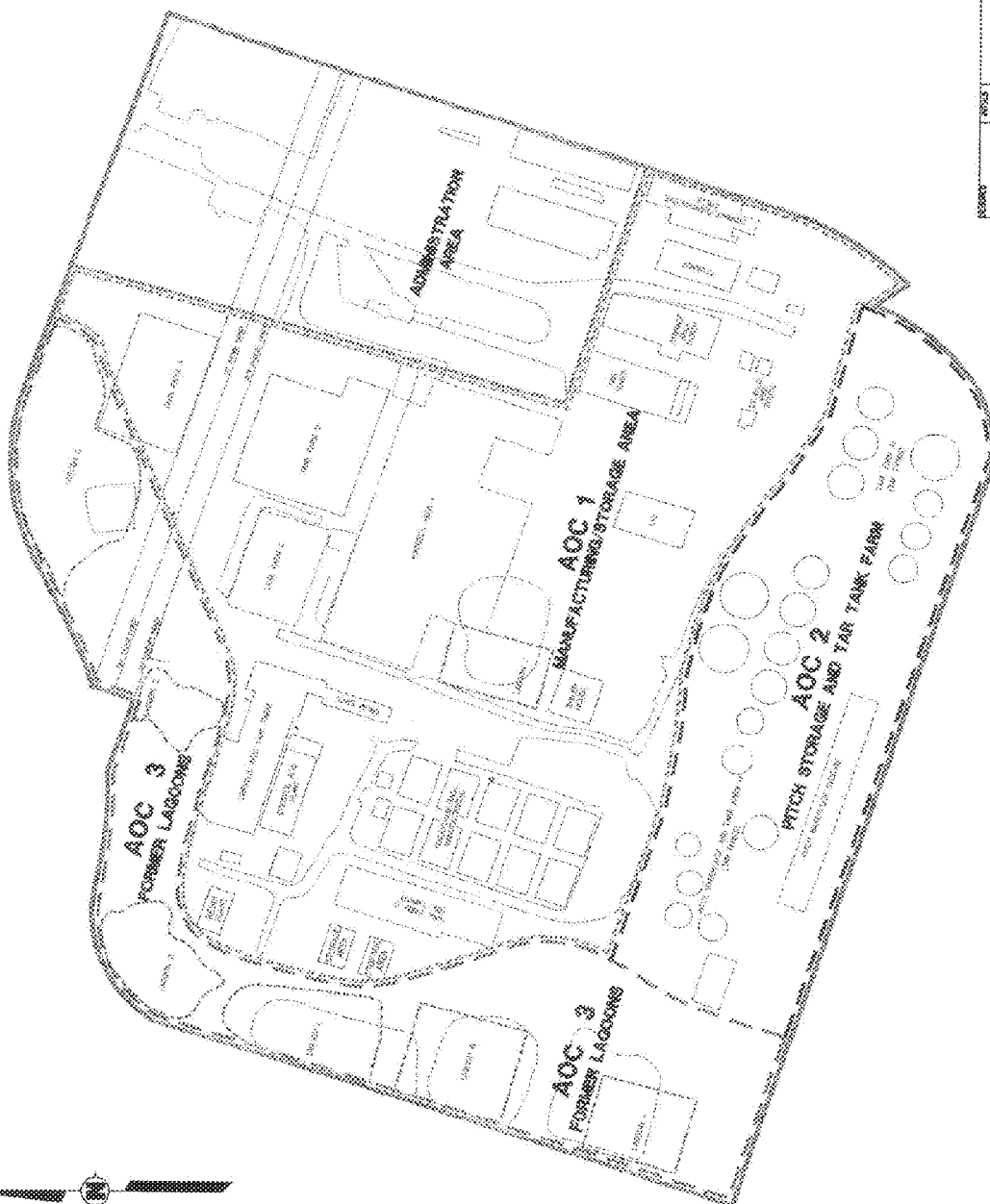
LEGEND

PREVIOUS LAGOON AREA-BASED
ON 1966 W-2C REPORT
ACTUAL LAGOON AREA-BASED
ON AIR PHOTO INTERPRETATIONS

AOC BOUNDARY LINES

AOC 1
AOC 2
AOC 3
ADMINISTRATIVE
AREA

SCALE



DATE	
BY	
CHKD	
APPD	
PROJECT/COMPANY	

Corporate Remediation Group
At: Atlantic Avenue
Between and the 1st Street Bridge
Bulky Off Photo, Building 27
Atlantic Avenue, Newark, NJ 07102

AOC AREA MAP	FIT CONSULT
	NEWARK, NEW JERSEY
DATE	DATE
BY	BY
CHKD	CHKD
APPD	APPD
PROJECT/COMPANY	PROJECT/COMPANY

LEGEND

PRECEDENCE LAGOON AREA-BASED
ON 1985 R-1-C REPORT
ACTUAL LAGOON AREA-BASED
ON AIR PHOTO INTERPRETATION
THICKNESS CONTOUR LINE
ASSUMED CONTOUR LINE
MONITORING WELL

AOC BOUNDARY LINES...

AOC 1

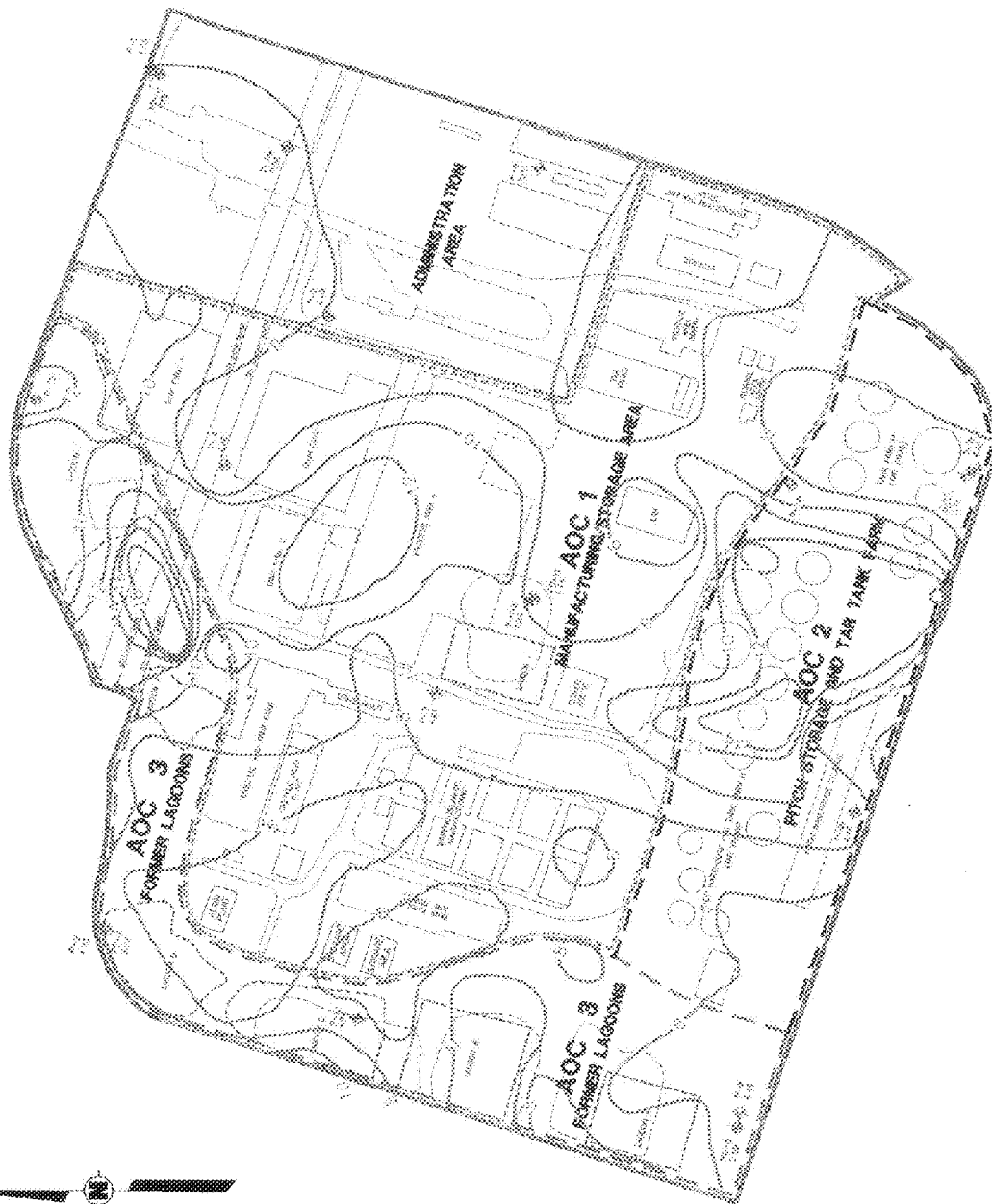
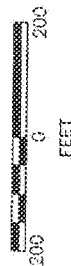
AOC 2

AOC 3

ADMINISTRATION
AREA

CONTOUR INTERVAL = 2 FEET

SCALE



NO.	DATE	BY	REVISION
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			



Corporate Remediation Group
An Atlantic Richfield Company
Refinery and Air & Gas Division Group

Project File Name: Building 27
Location: Refinery, Refinery 1985-2007

FILL THICKNESS

FIT CONSOLE
HEWLETT, NEW JERSEY

NO.	DATE	BY	REVISION
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

LEGEND

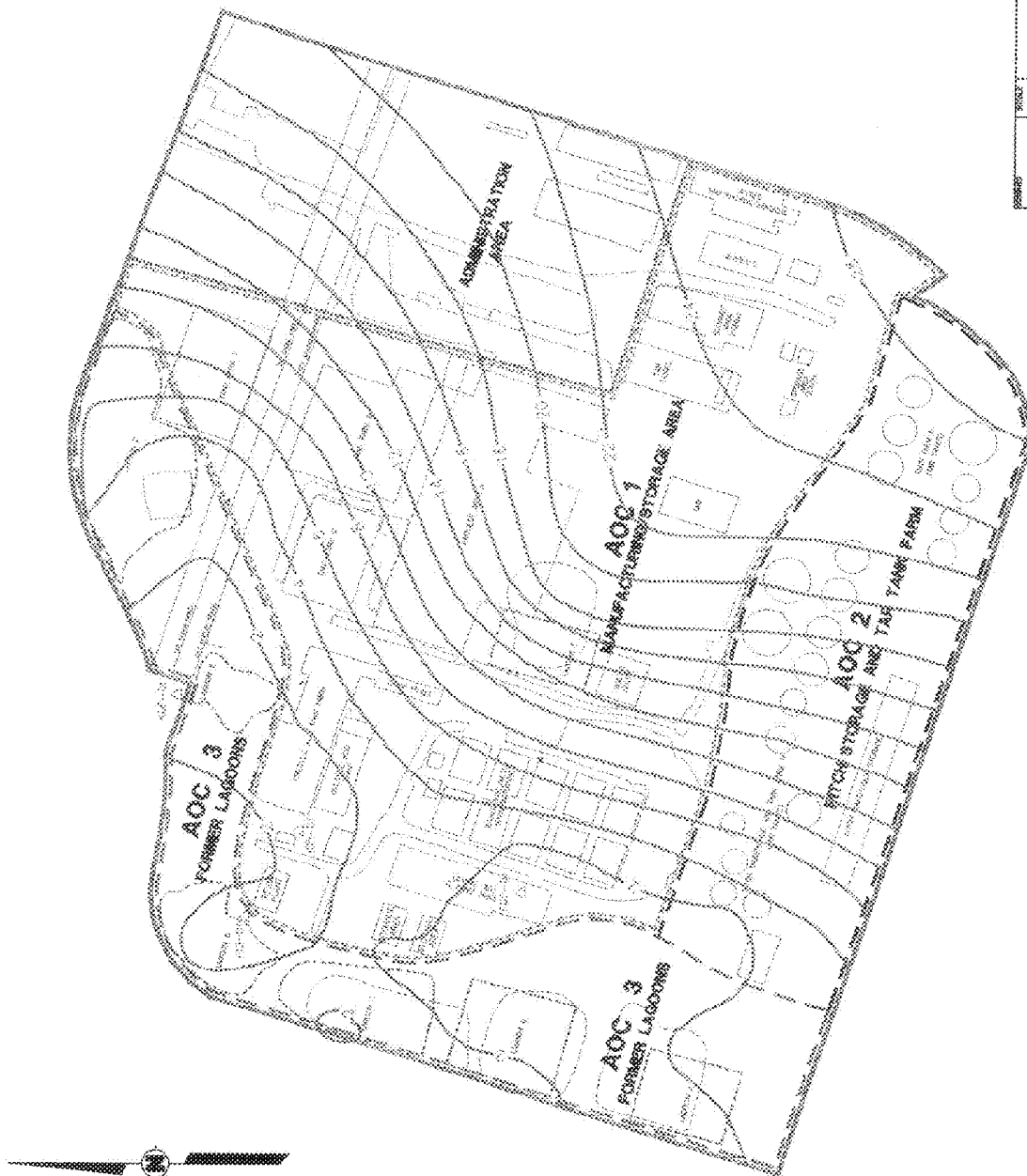
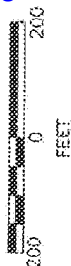
- PROPOSED LAGOON AREA BASED ON 1985 X-CO REPORT
- ACTUAL LAGOON AREA BASED ON AIR PHOTO REMOTE SENSING
- PEATY CLAY THICKNESS CONTOUR
- PEATY CLAY NOT ENCOUNTERED

AOC BOUNDARY LINE

- AOC 1
- AOC 2
- AOC 3
- ADMINISTRATIVE AREA

CONTOUR INTERVAL = 2 FEET

SCALE



NO.	DATE	BY	REVISION
1	10/1/01	JLH	INITIAL DESIGN
2	10/1/01	JLH	REVISION
3	10/1/01	JLH	REVISION
4	10/1/01	JLH	REVISION
5	10/1/01	JLH	REVISION
6	10/1/01	JLH	REVISION
7	10/1/01	JLH	REVISION
8	10/1/01	JLH	REVISION
9	10/1/01	JLH	REVISION
10	10/1/01	JLH	REVISION

Corporate Remediation Group
An Olan Mills Company
2000 N. 10th Street, Suite 200
Baltimore, MD 21201
Tel: 410.528.1234
Fax: 410.528.1235
www.olanmills.com

PEATY CLAY THICKNESS MAP
PIT CONSOLE
NEWARK, NEW JERSEY
Scale: 1" = 200'
Date: 10/1/01
Sheet: 2 of 3

LEGEND

PREVIOUS LAGOON AREA-BASED
ON 1988 PHOTO REPORT
ACTUAL LAGOON AREAS BASED
ON AIR PHOTO INTERPRETATION
THICKNESS CONTOUR LINE
MEASURING WELL

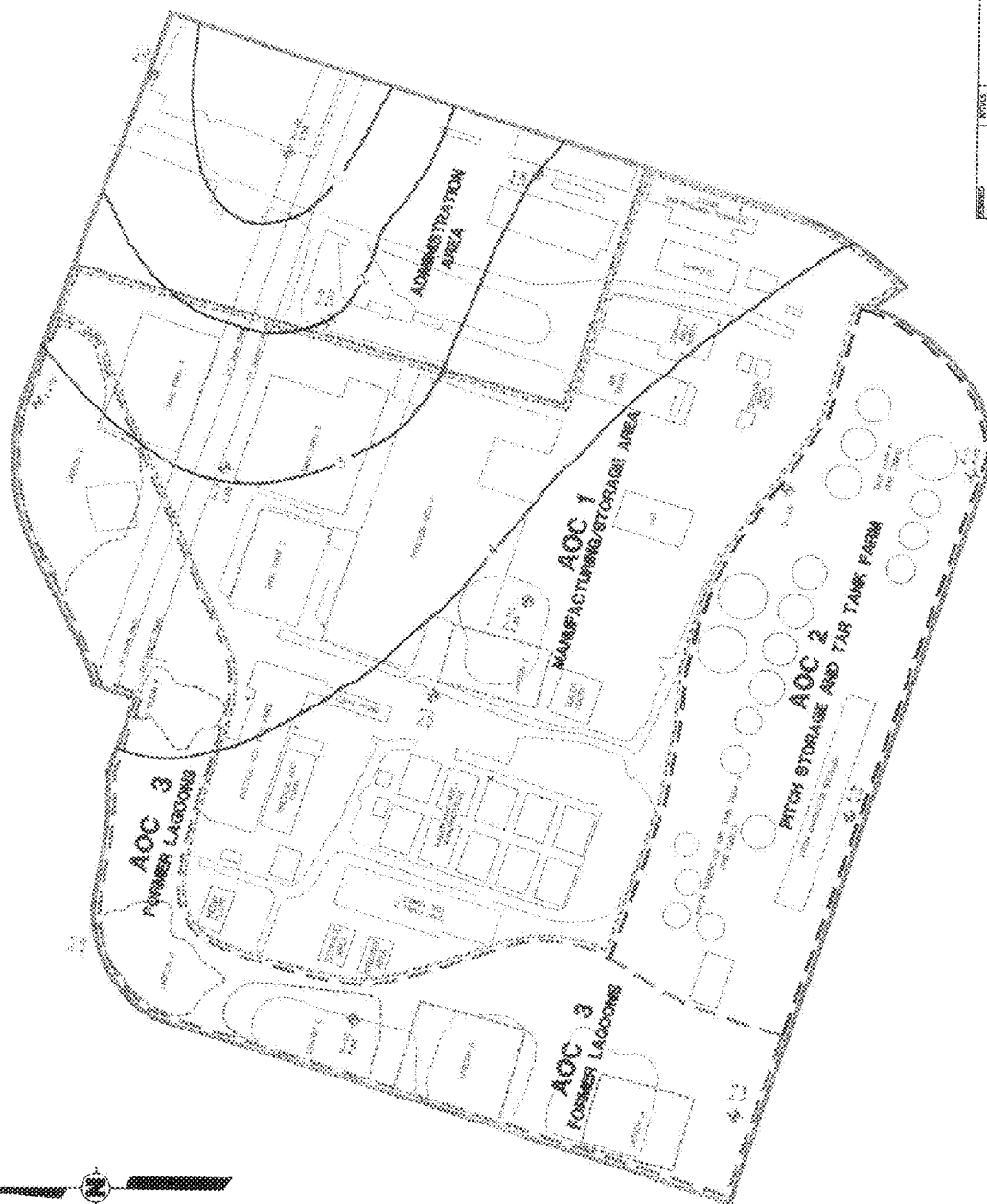
AOC BOUNDARY LINE

AOC 1
AOC 2
AOC 3
ADMINISTRATION
AREA

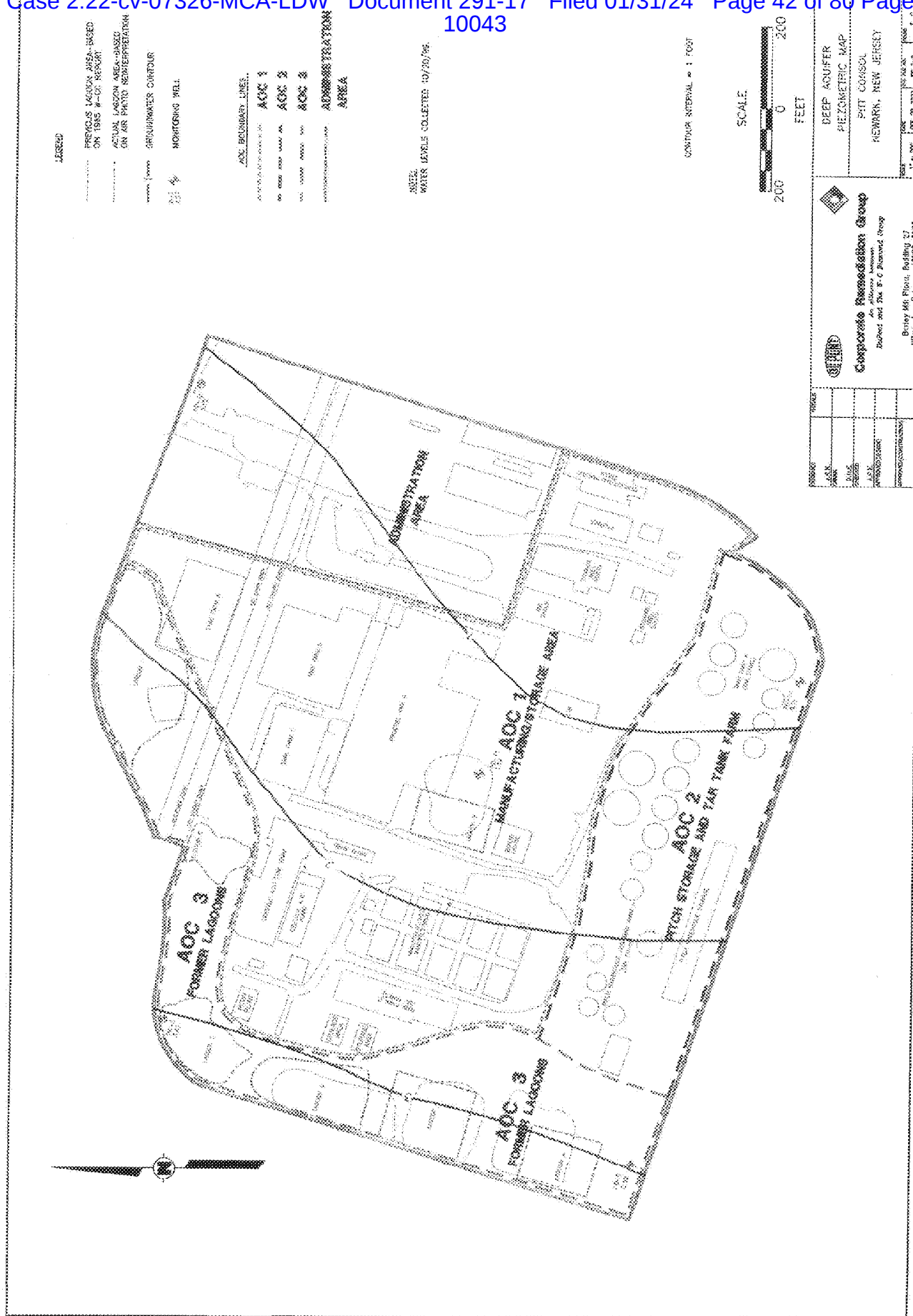
NOTE:
WATER LEVELS COLLECTED 10/10/85.

CONTOUR INTERVAL = 1 FOOT

SCALE




<p>Corporate Remediation Group An Atlantic Richfield Company Before and For R.C. Johnson Group</p> <p>Barley Mill Plaza, Building 27 Woodstock, Delaware 19887-5527</p>		<p>SHALLOW GROUNDWATER HYDROMETRIC MAP</p> <p>PIT CONSOLE BERANK, NEW JERSEY</p>	
DATE	NO.	DATE	NO.
10/10/85	1	10/10/85	1
DATE	NO.	DATE	NO.
10/10/85	1	10/10/85	1

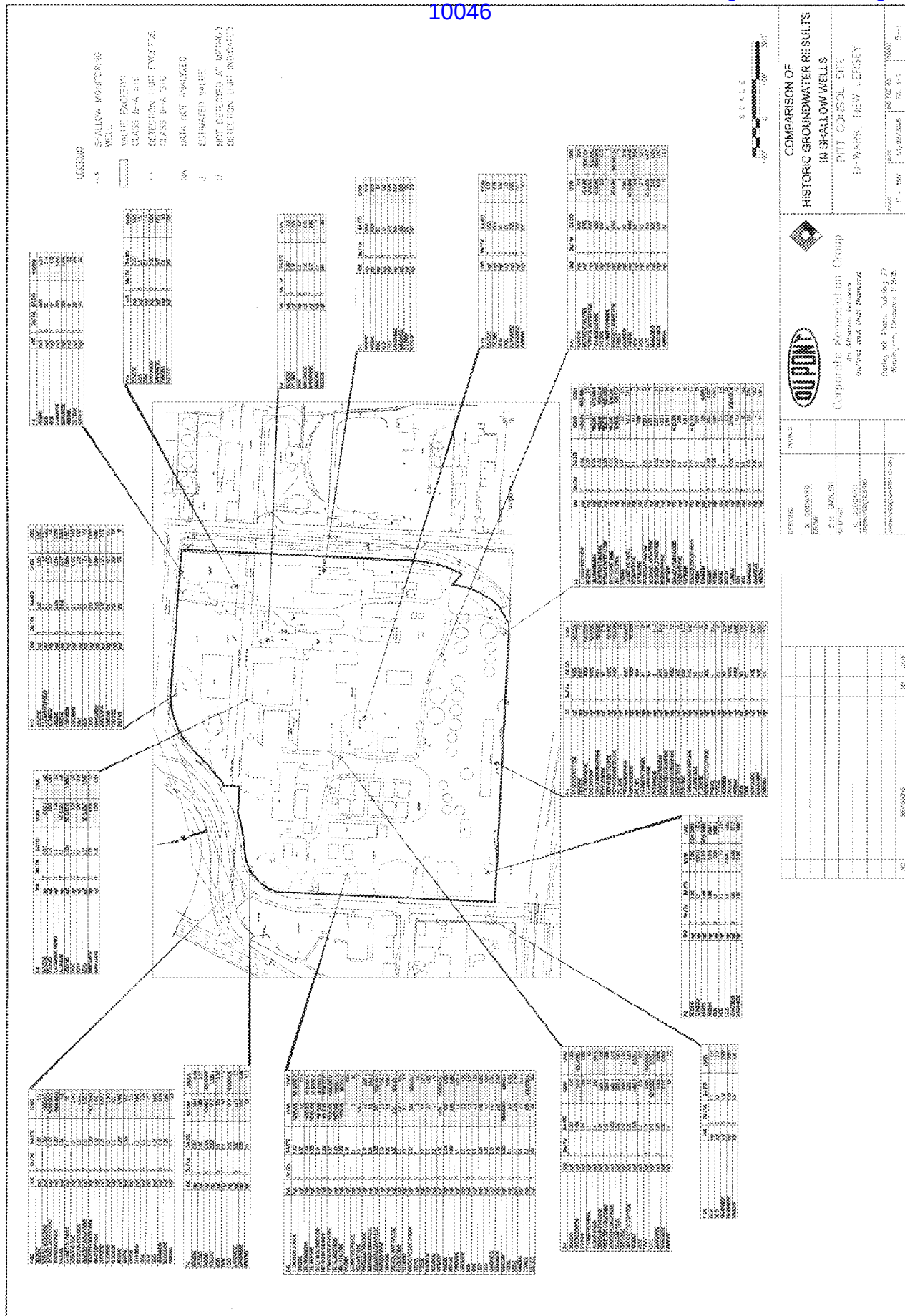


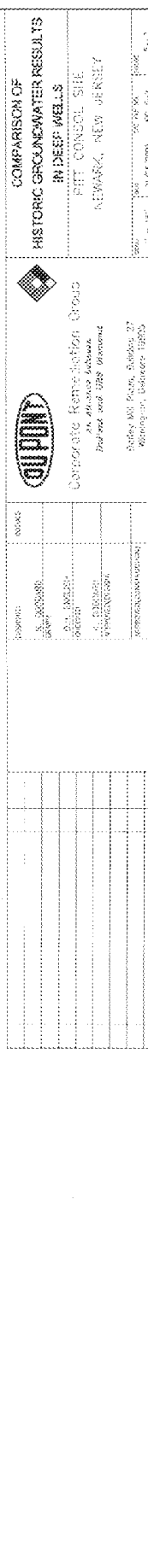




CONTOUR MAP OF CONTAMINANT CONCENTRATIONS - DEEP AQUIFER
PHT CONSOL.
NEWARK-NEW JERSEY

 **Corporate Remediation Group**
An Integral Solution
To Your And The World's Cleanup Issues
Corporate Remediation, Inc. 37
Washington Avenue, Suite 200
New York, NY 10014





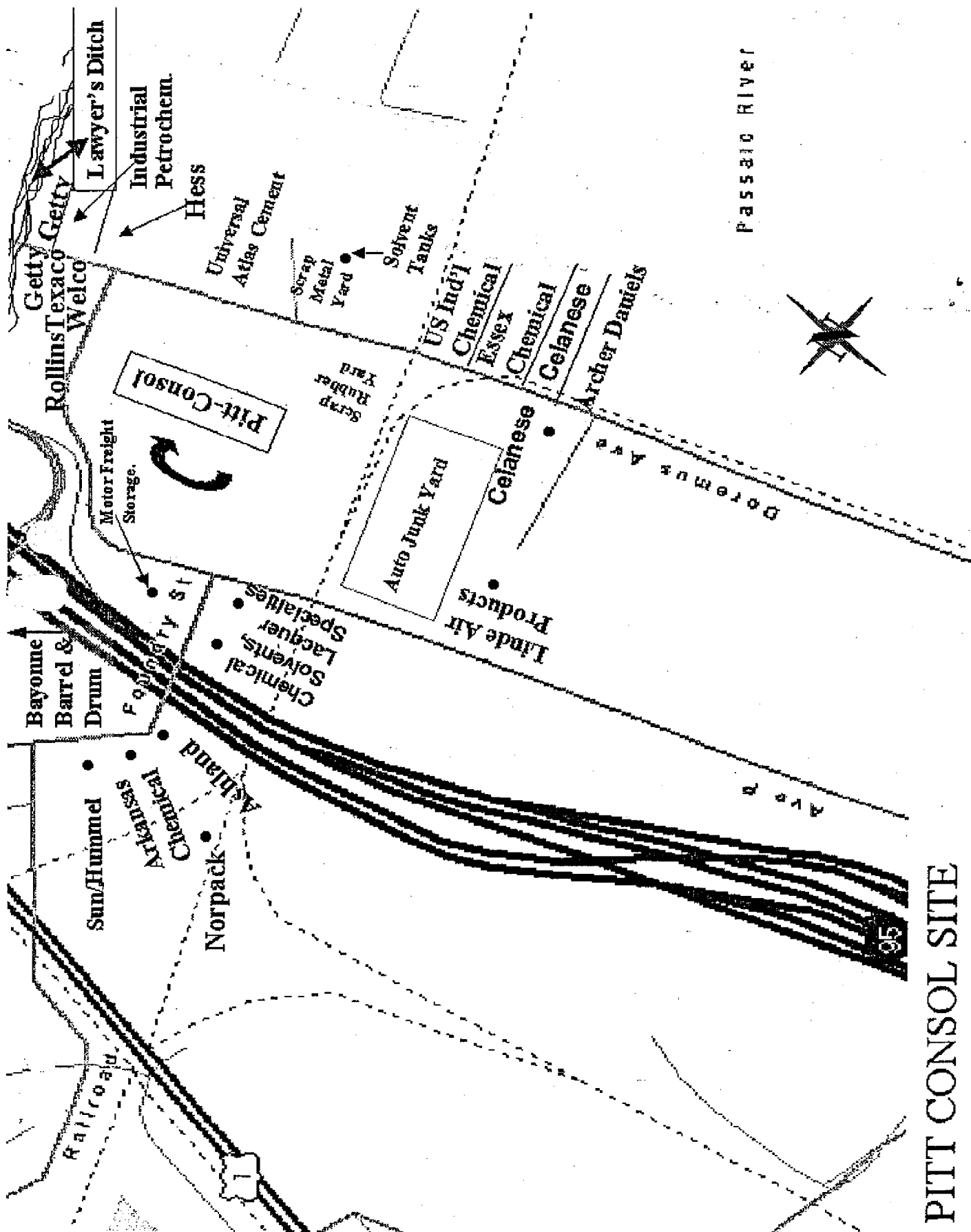


Figure 5-1

Off-Site Property Map



ACTUAL LOCATION AREA - 03500

THEXNEX CONTROLS, INC.

ACKNOWLEDGMENTS

506 *NOTES*

MINISTRY OF DEFENSE

ACCO EXCUNDA: JMS.

130

25

350

SECRET

CONFIDENTIAL - EYES ONLY

420

92.
93.
94.
95.

ငါးကောင်စီကို ခုတ်စားရန် ချီတက်နေကြသည်။

[illegible]

Birney MB Plaza, Building 27
Washington, D.C. 20535-0027

[illegible]

5000	DATE	OF 12	PAGE
1" = 300'	NOV. 24, 2000	PL-3	7-3

LINE OF WELLS USED FOR
CONCENTRATION vs DISTANCE GRAPH

PIT CONSOL.
NEWARK, NEW JERSEY

Figure 7-3
Benzene Concentration Vs. Distance
Wells P-10, P-3, P-11S, P-8, and P-4 Respectively

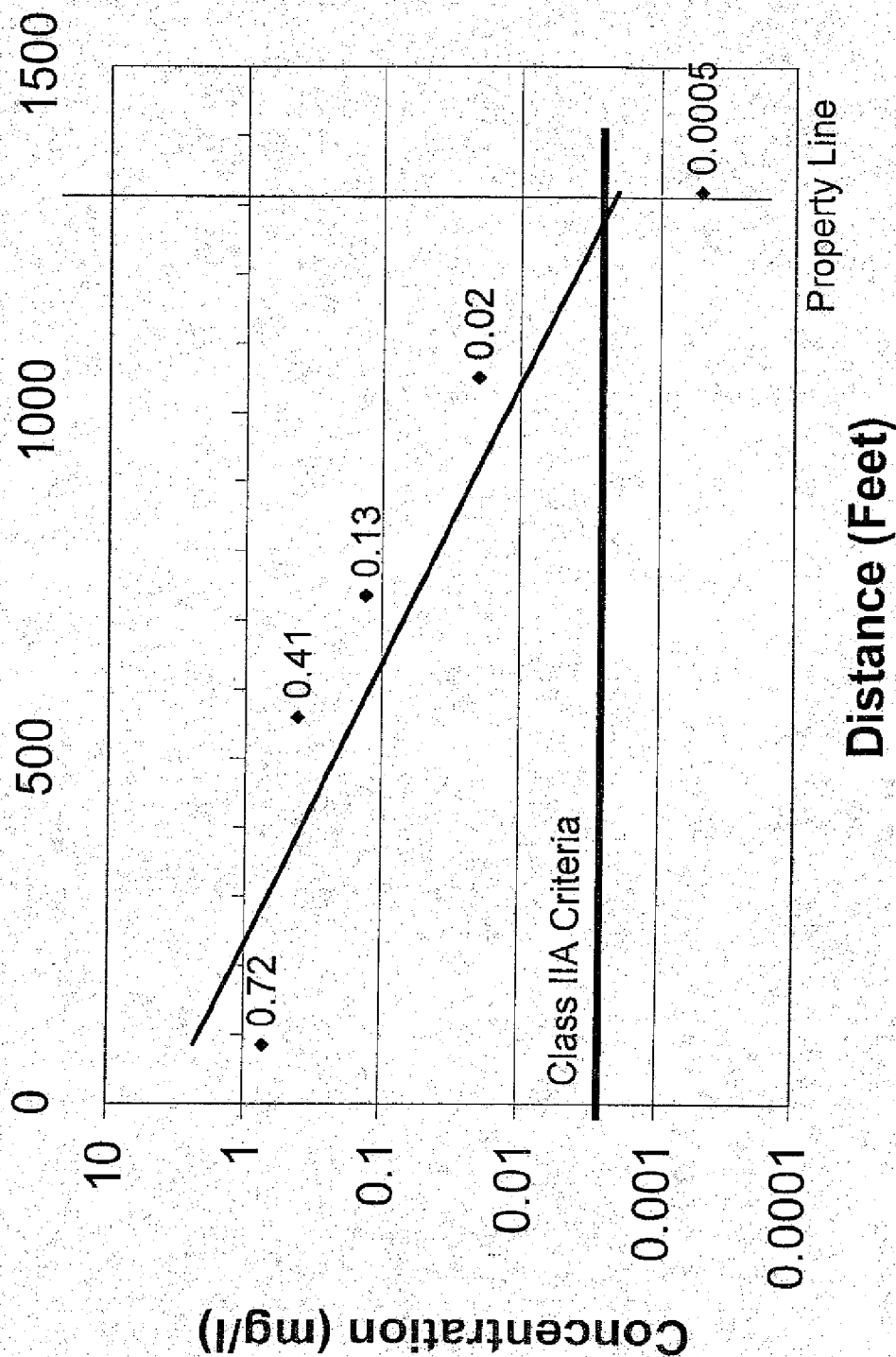


Figure 7-4
Total PAHs Vs. Distance
Wells P-10, P-3, P-11S, P-8, and P-4 Respectively

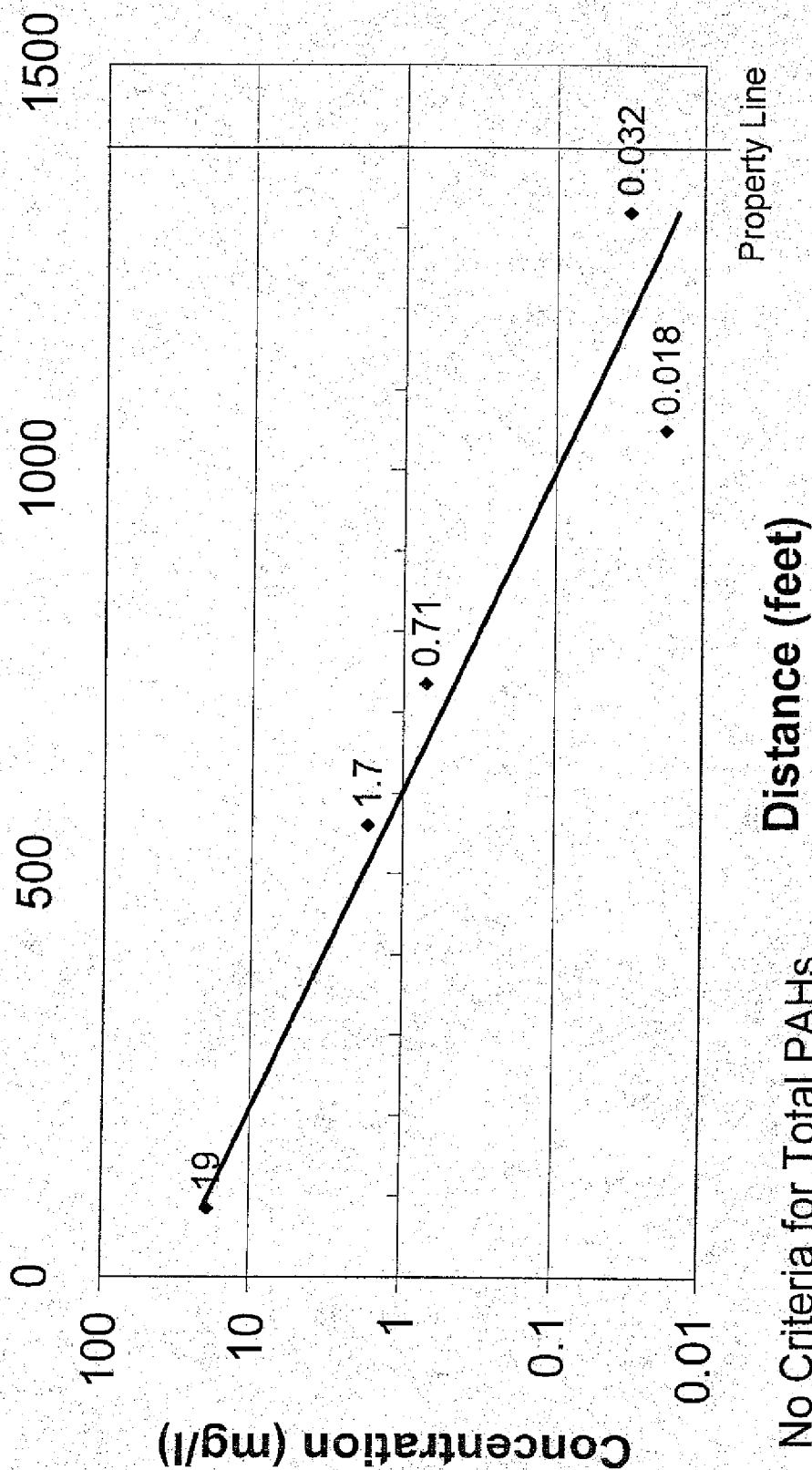


Figure 7-5
Benzo(a)anthracene Concentrations Vs. Distance
Wells P-10, P-3, P-11S, P-8 and P-4 Respectively

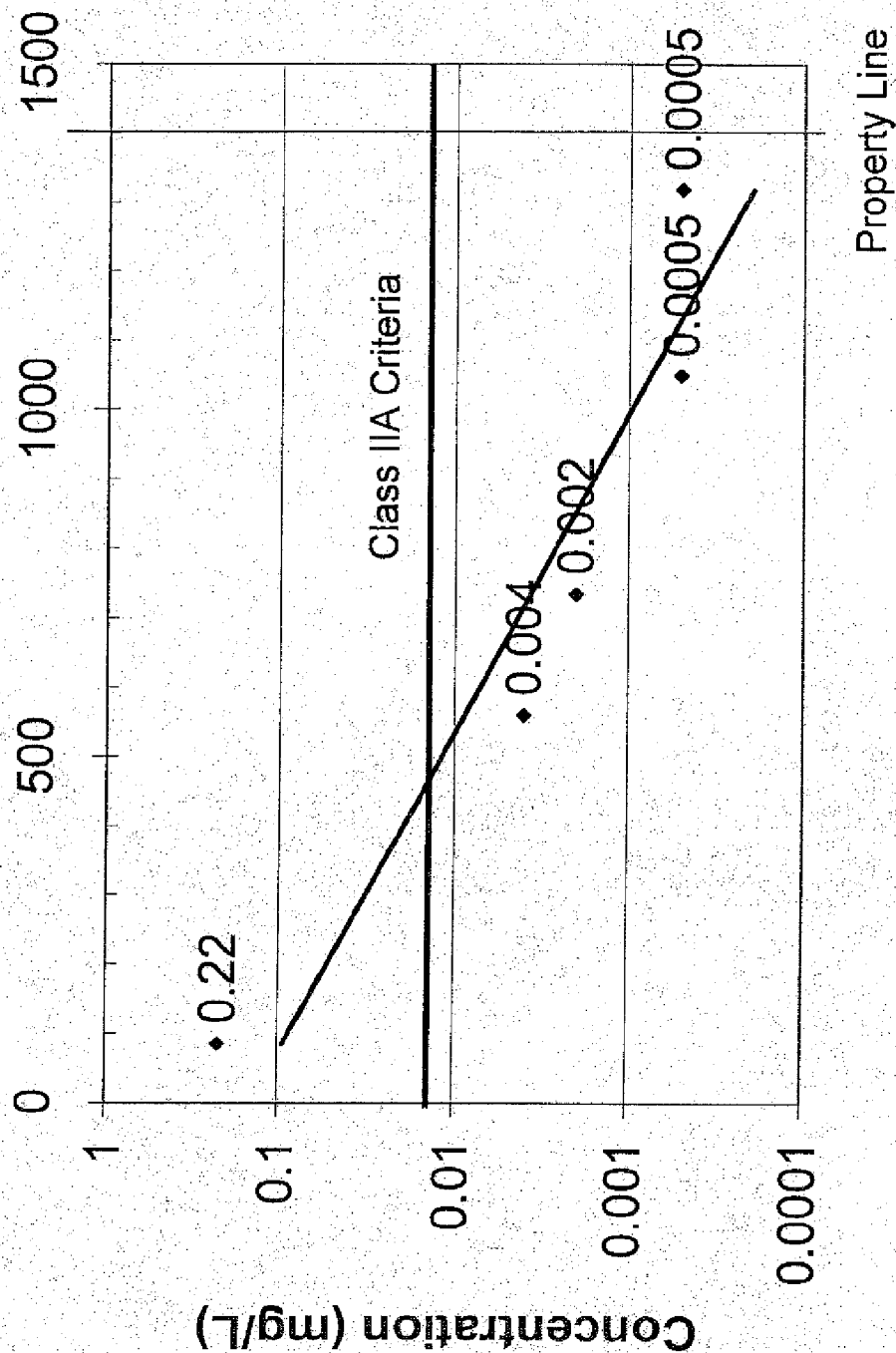


Figure 7-6
Benzo(a)pyrene Concentrations Vs. Distance
Wells P-10, P-3, P-11S, P-8 and P-4 Respectively

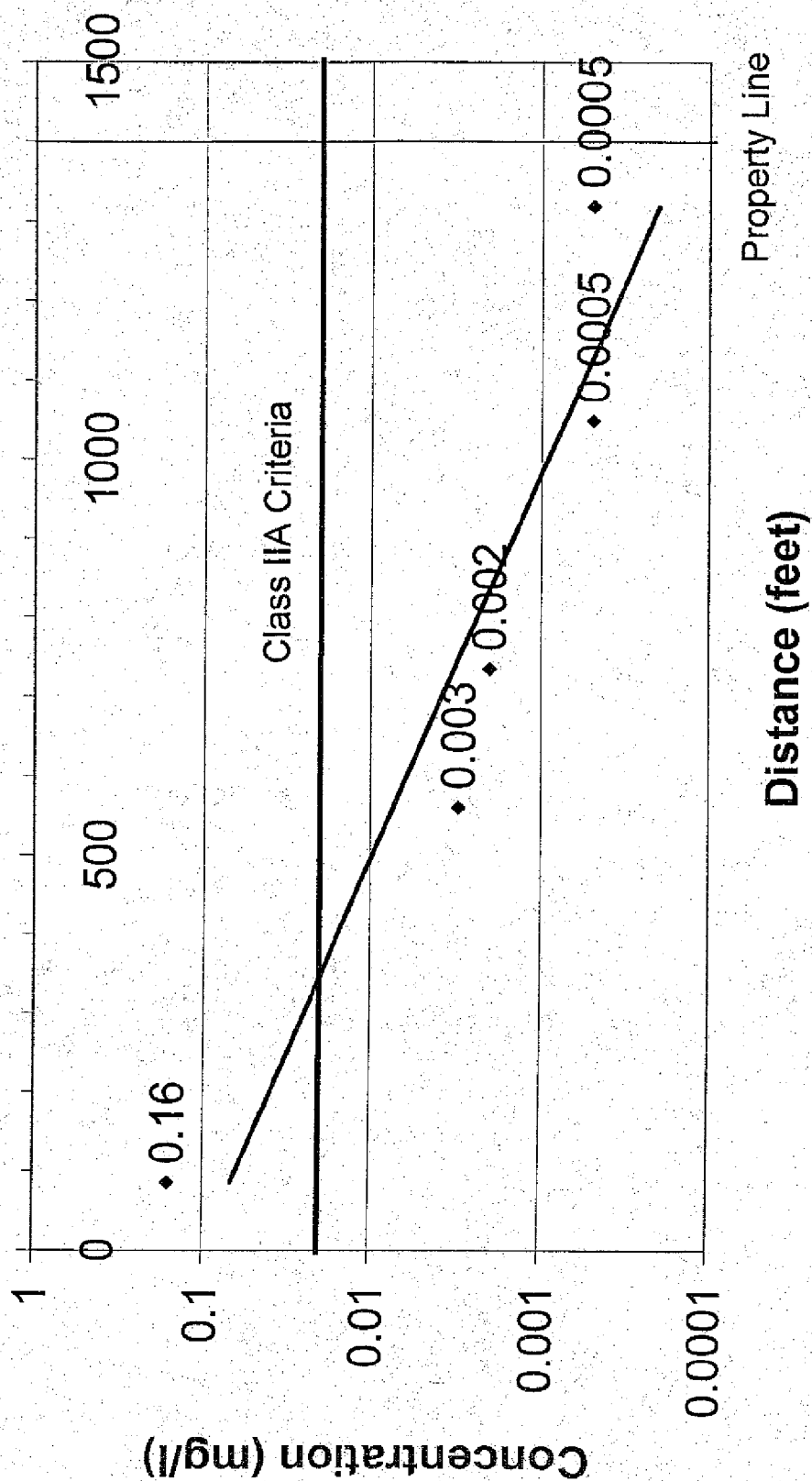


Figure 7-7
Benzo(b)fluoranthene Concentrations Vs. Distance
Wells P-10, P-3, P-11S, P-8 and P-4 Respectively

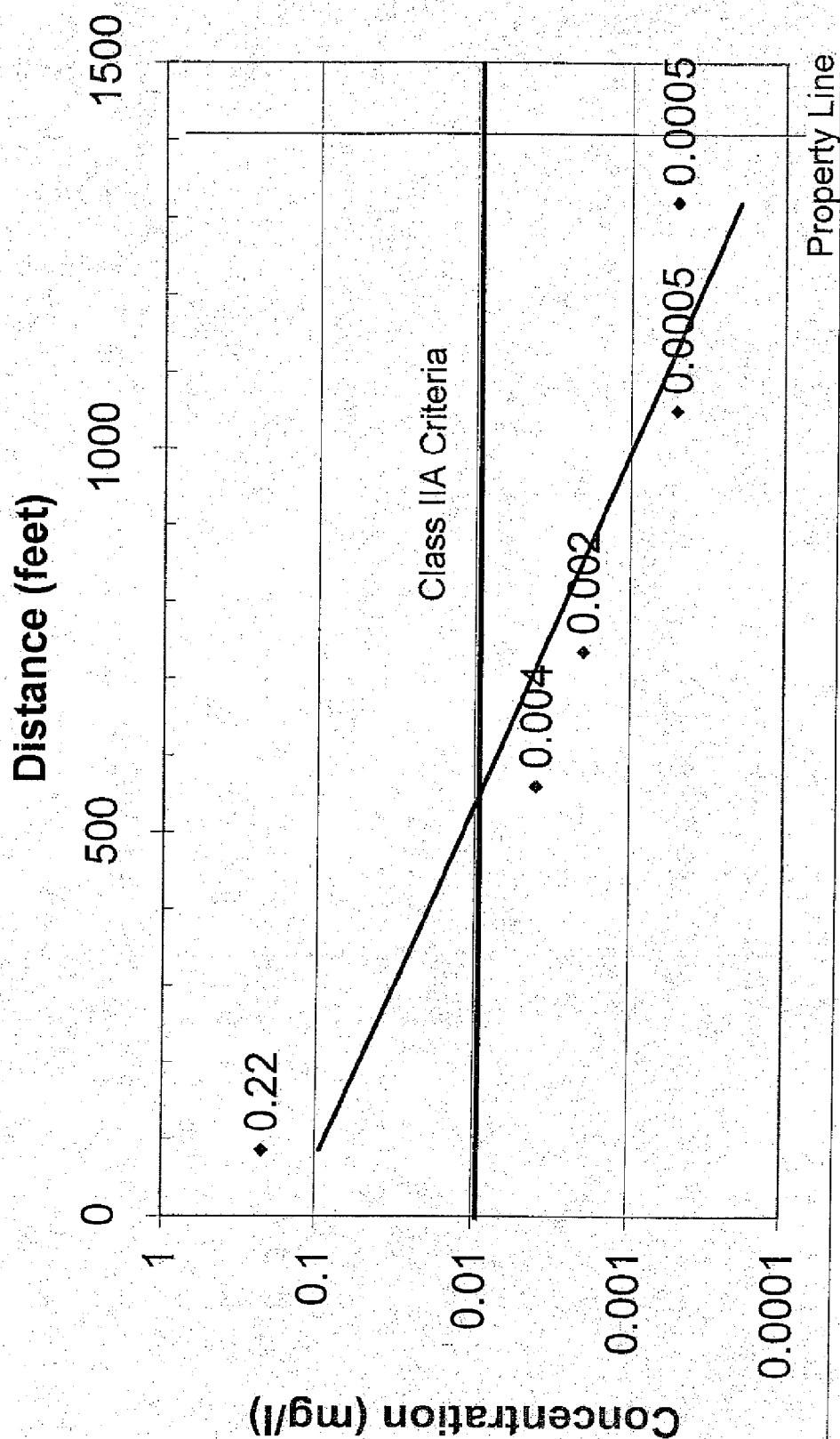


Figure 7-8
Benzo(K)fluoranthene Concentrations Vs Distance Wells
P-10, P-3, P-11S, P-8 and P-4 Respectively

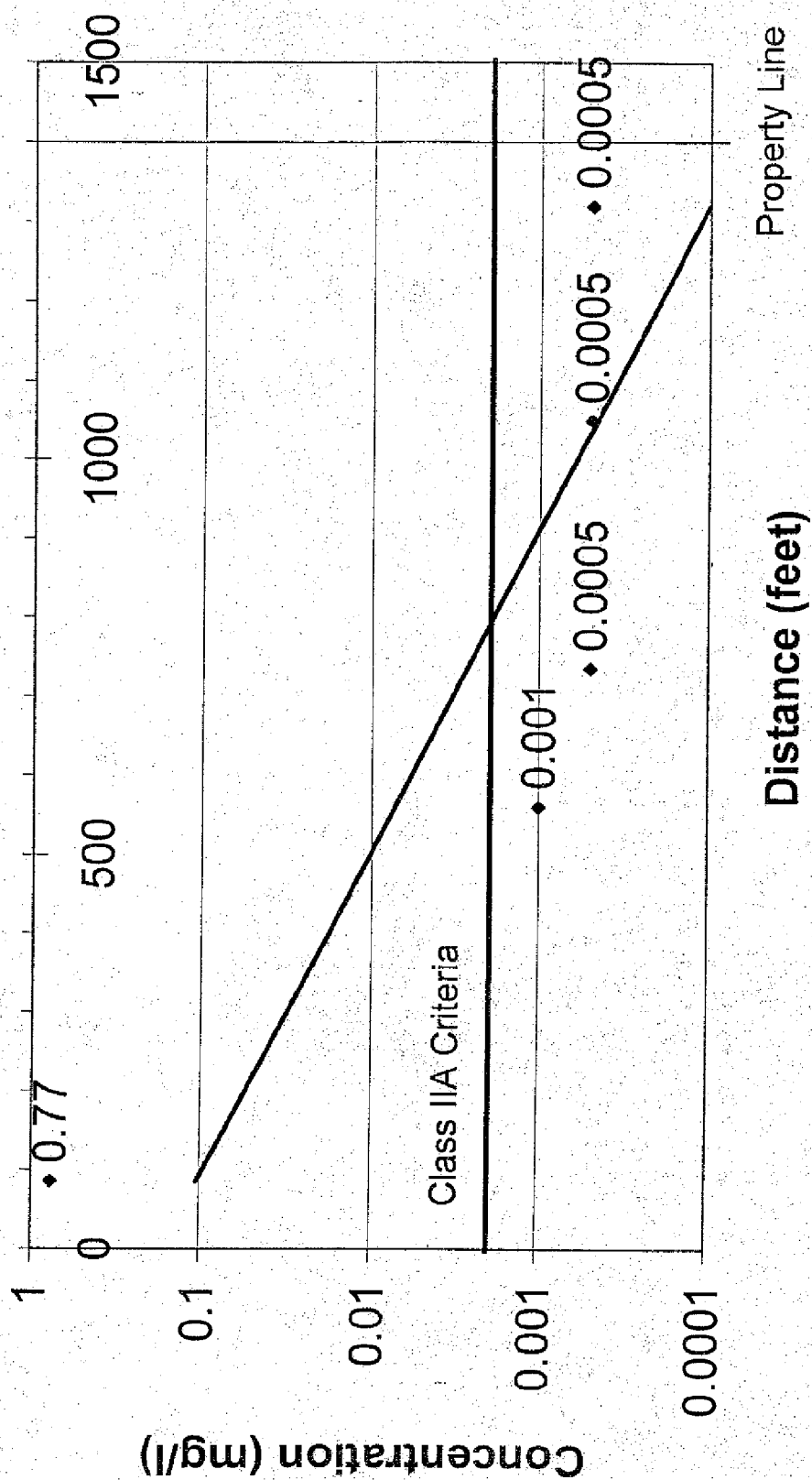


Figure 7-9
Chrysene Concentrations vs. Distance
Wells P-10, P-3, P-11S, P-8 and P-4 Respectively

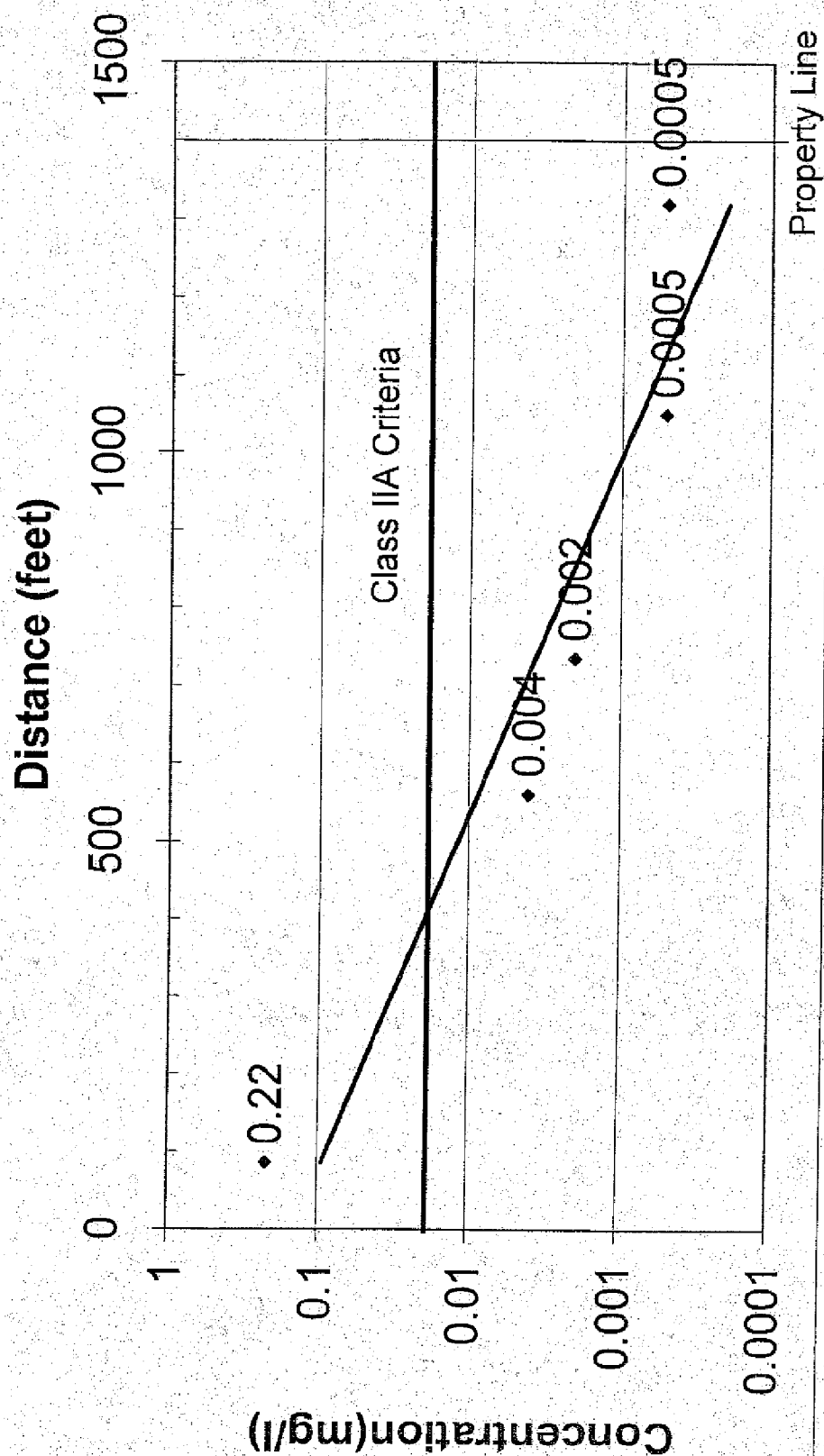


Figure 7-10
Dibenzo(a,h)anthracene Concentration Vs. Distance, Wells
P-10, P-3, P-11S, P-8 and P-4 Respectively

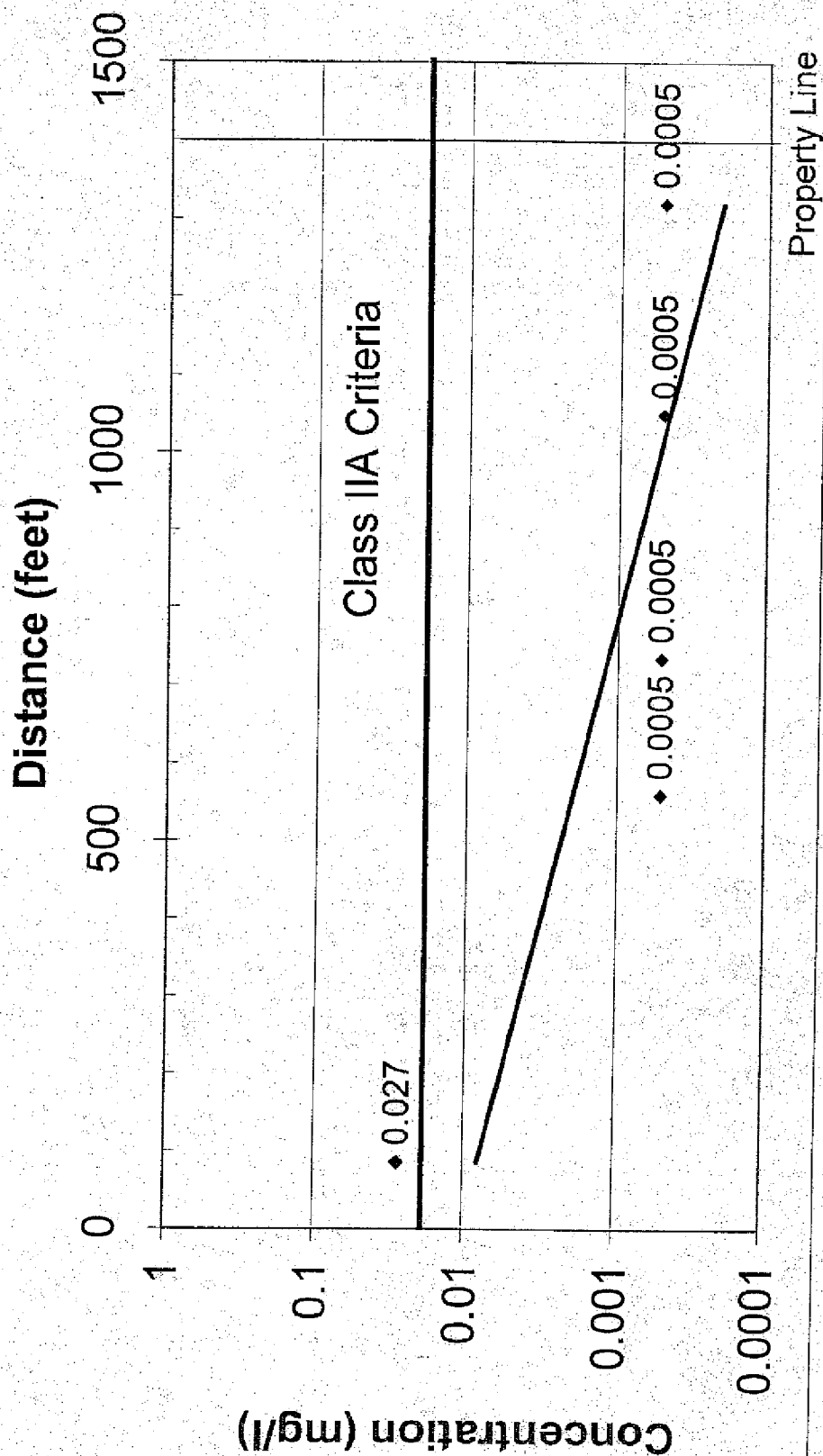


Figure 7-11
Indeno(1,2,3-cd)pyrene Concentration Vs Distance Wells
P-10, P-3, P-11S, P-8 and P-4 Respectively

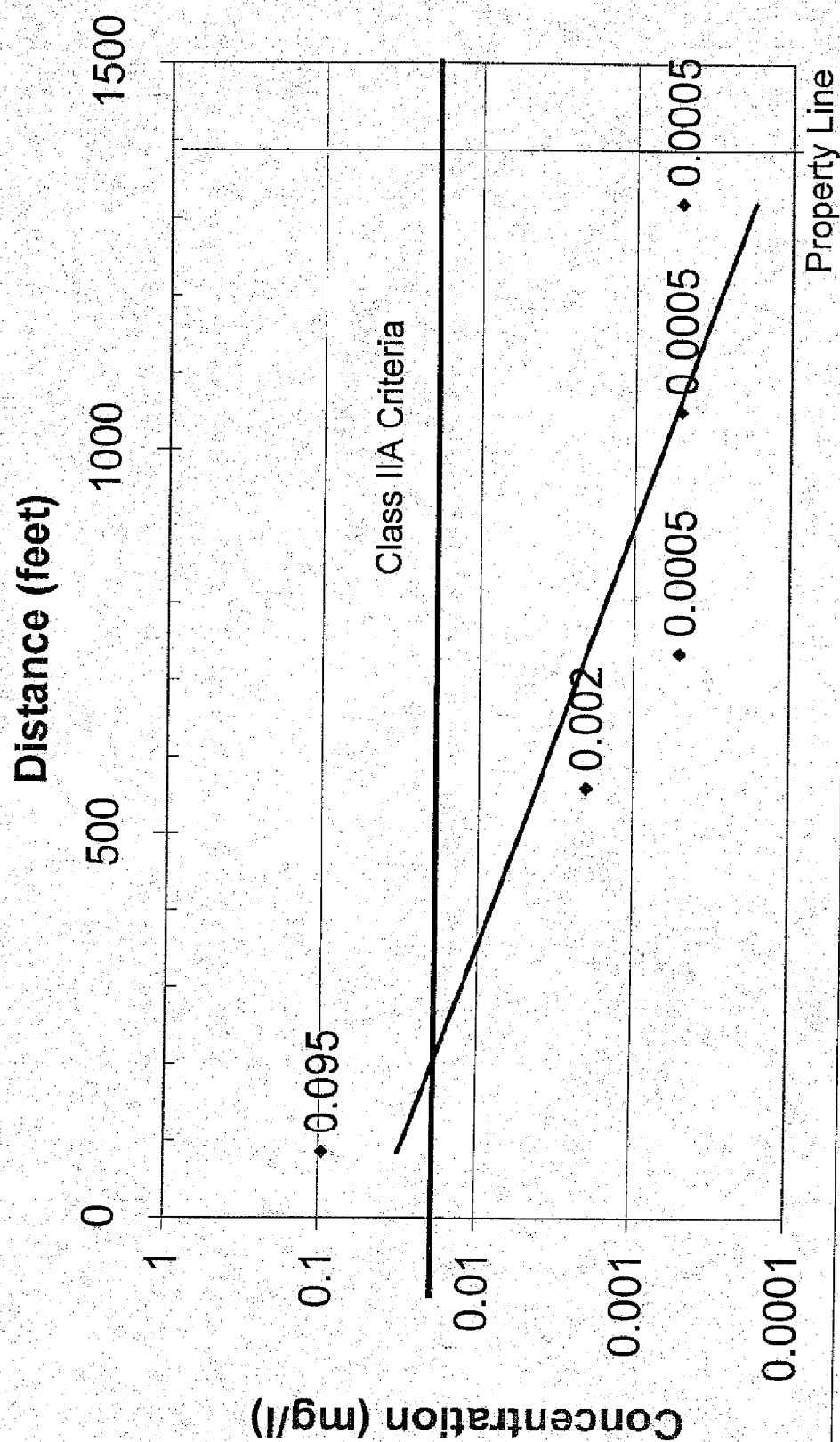
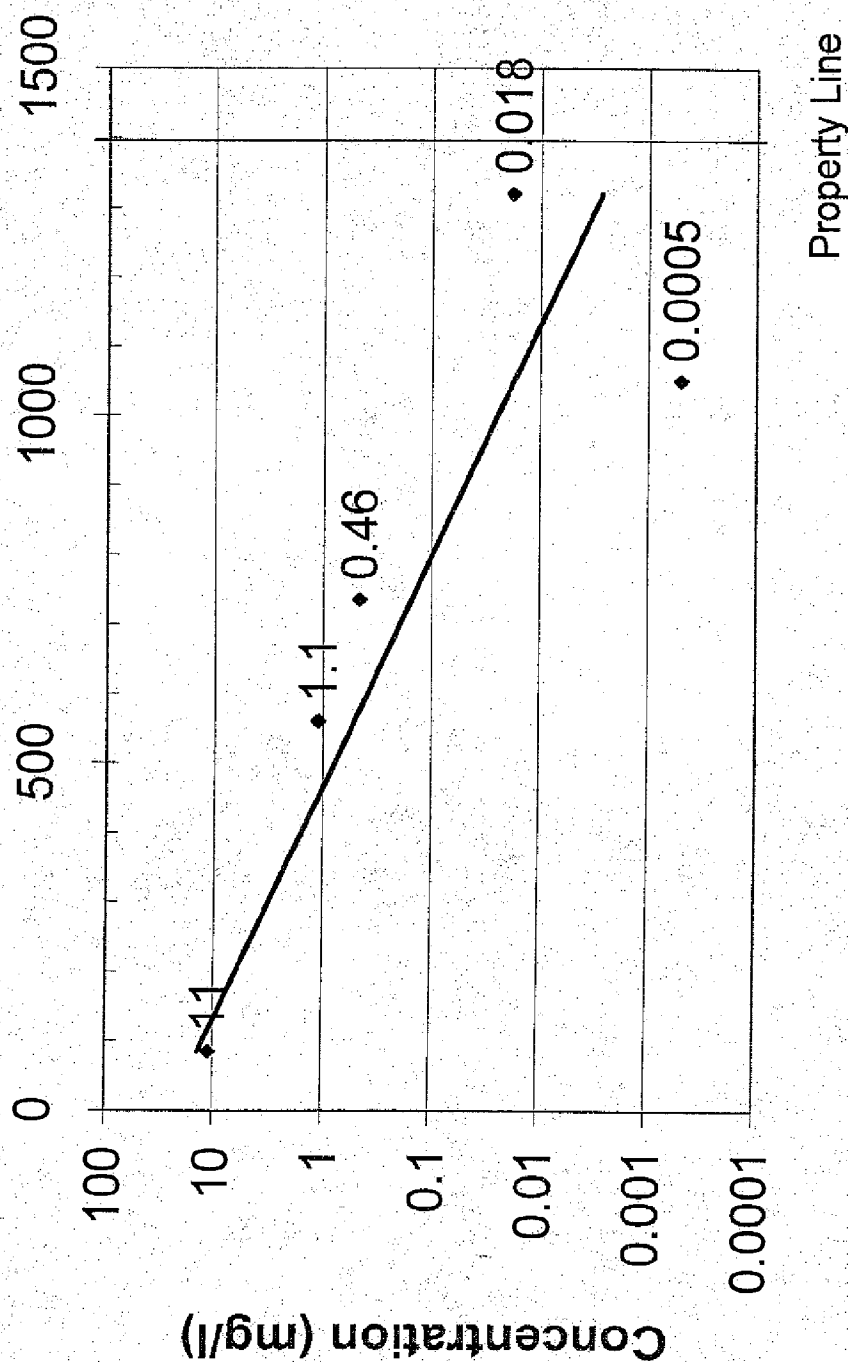


Figure 7-12
Naphthelene Concentrations Vs. Distance
Wells P-10, P-3, P-11S, P-8 and P-4 Respectively



No Class IIA Criteria

Property Line

Figure 7-13
Well P-1: Concentration vs. Time

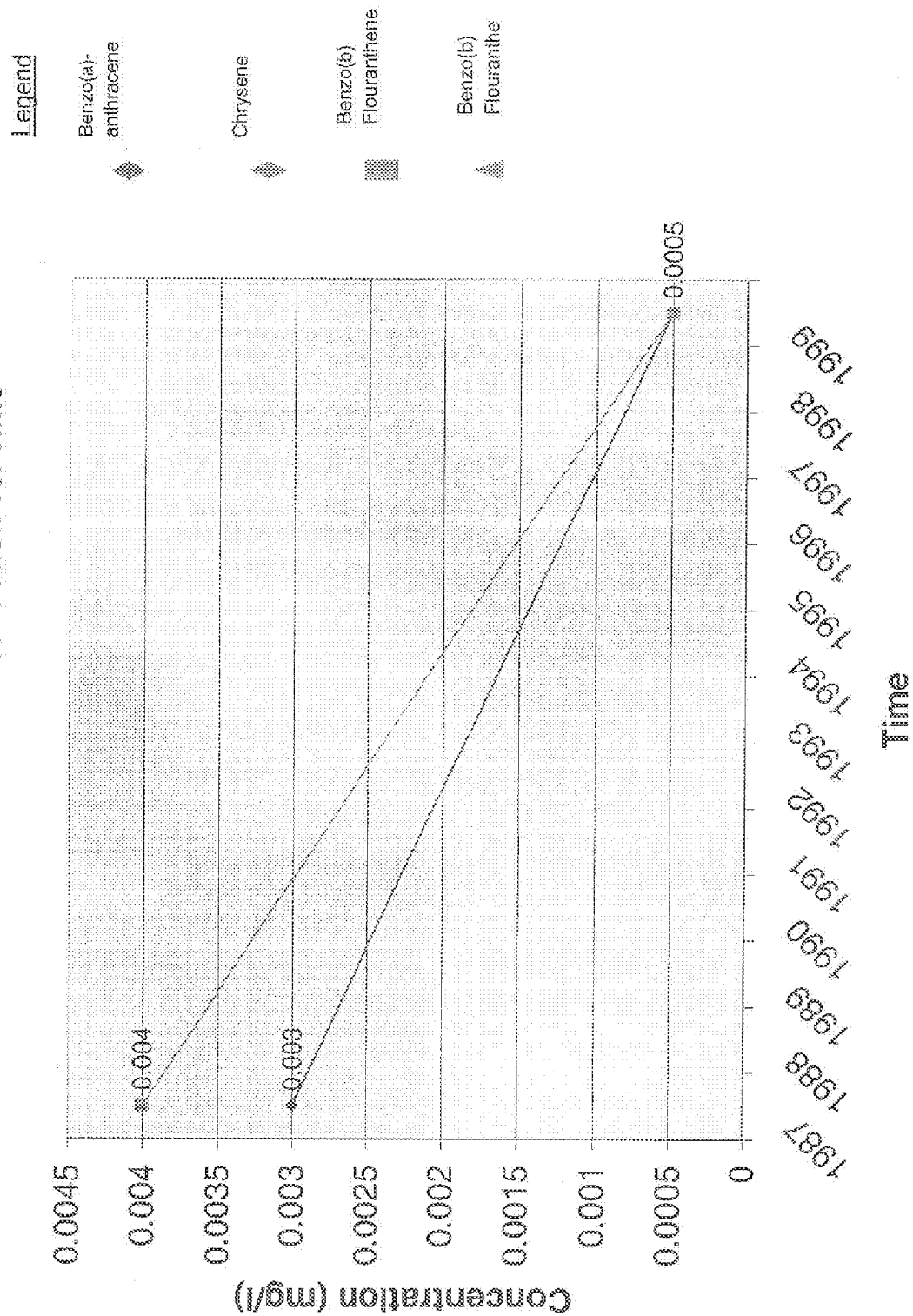


Figure 7-14a
Well P-2: Concentration vs. Time

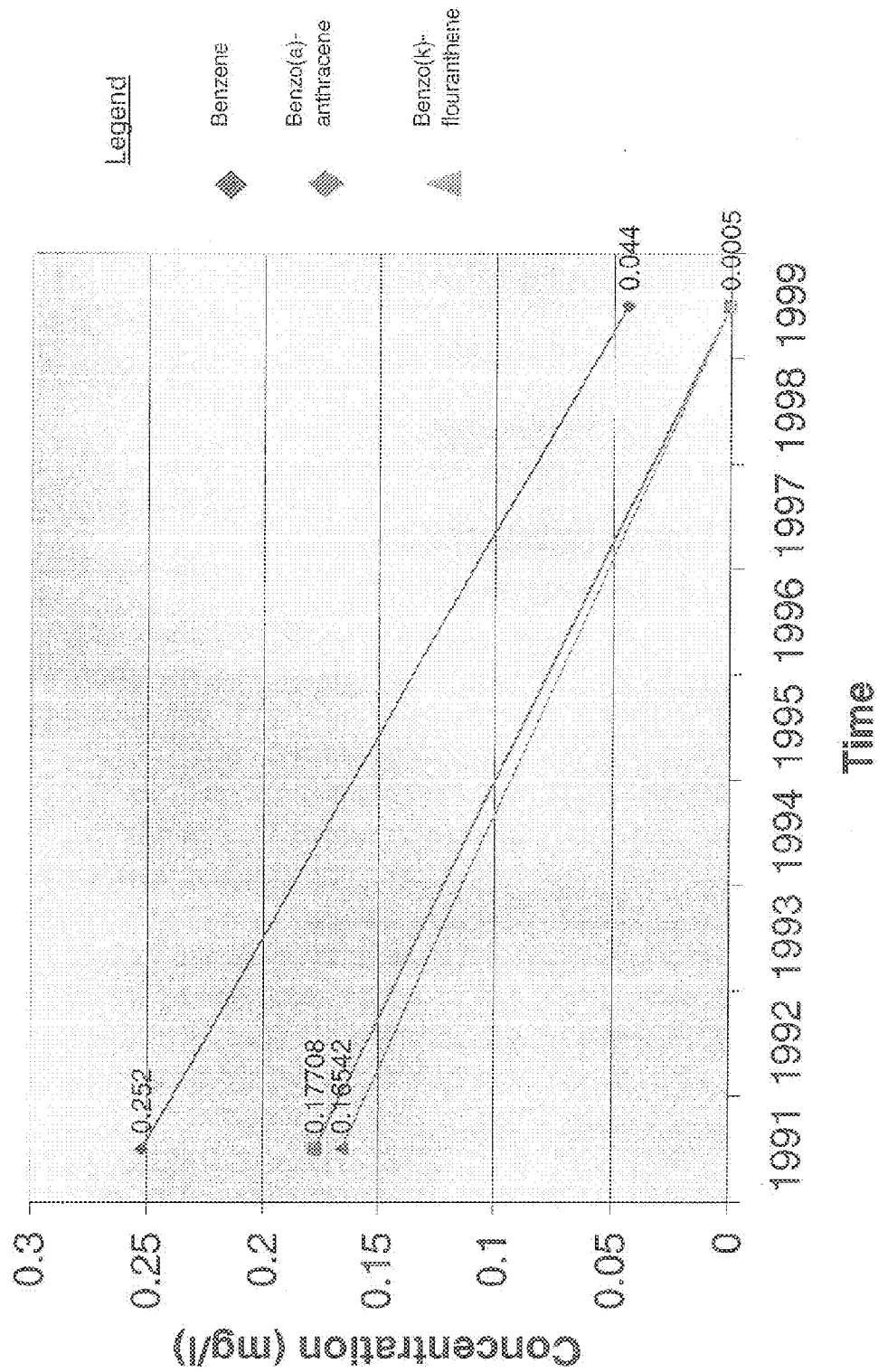


Figure 7-14b
Well P-2: Concentration vs. Time

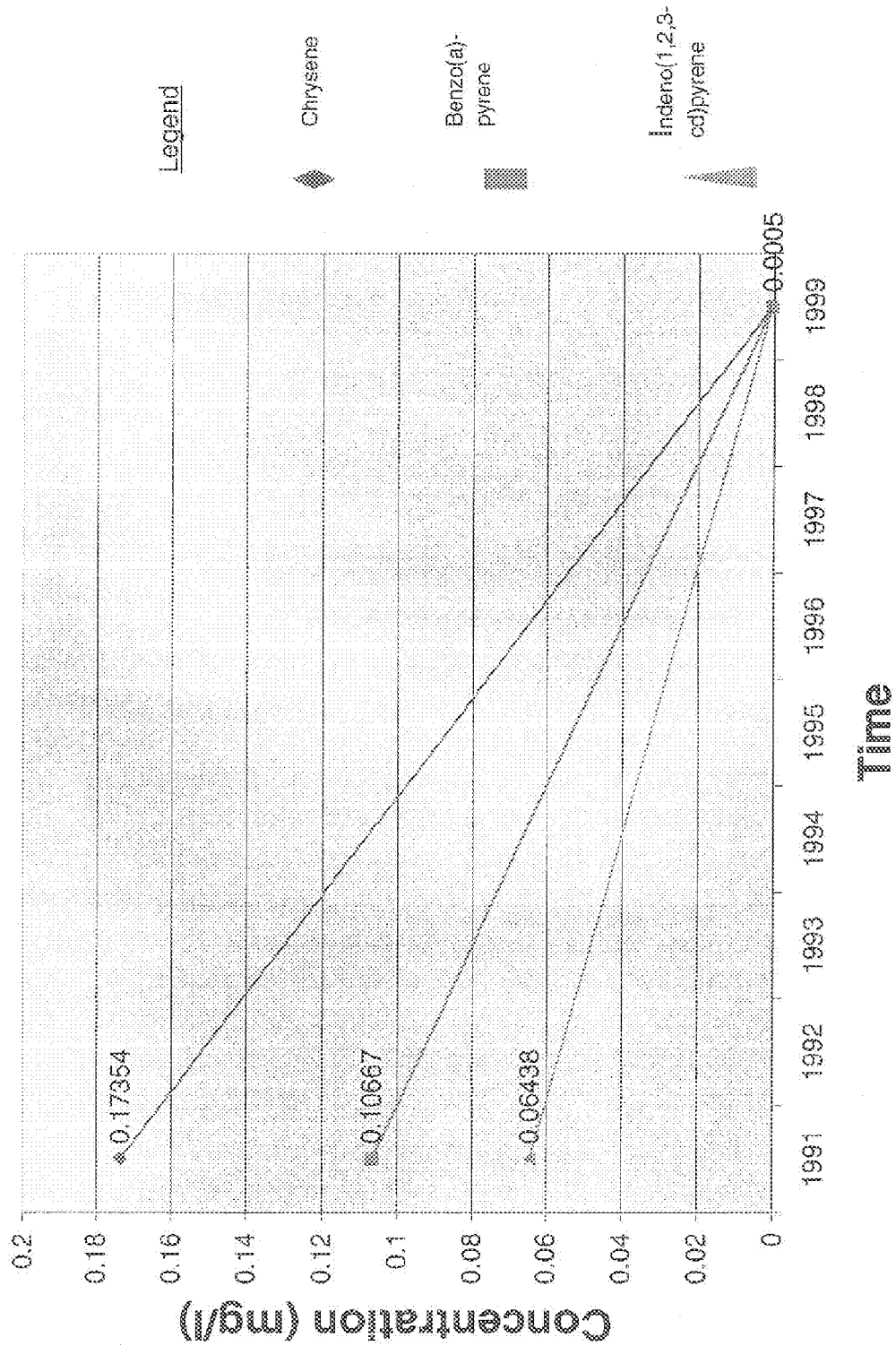


Figure 7-15a
Well P-5: Concentration vs. Time

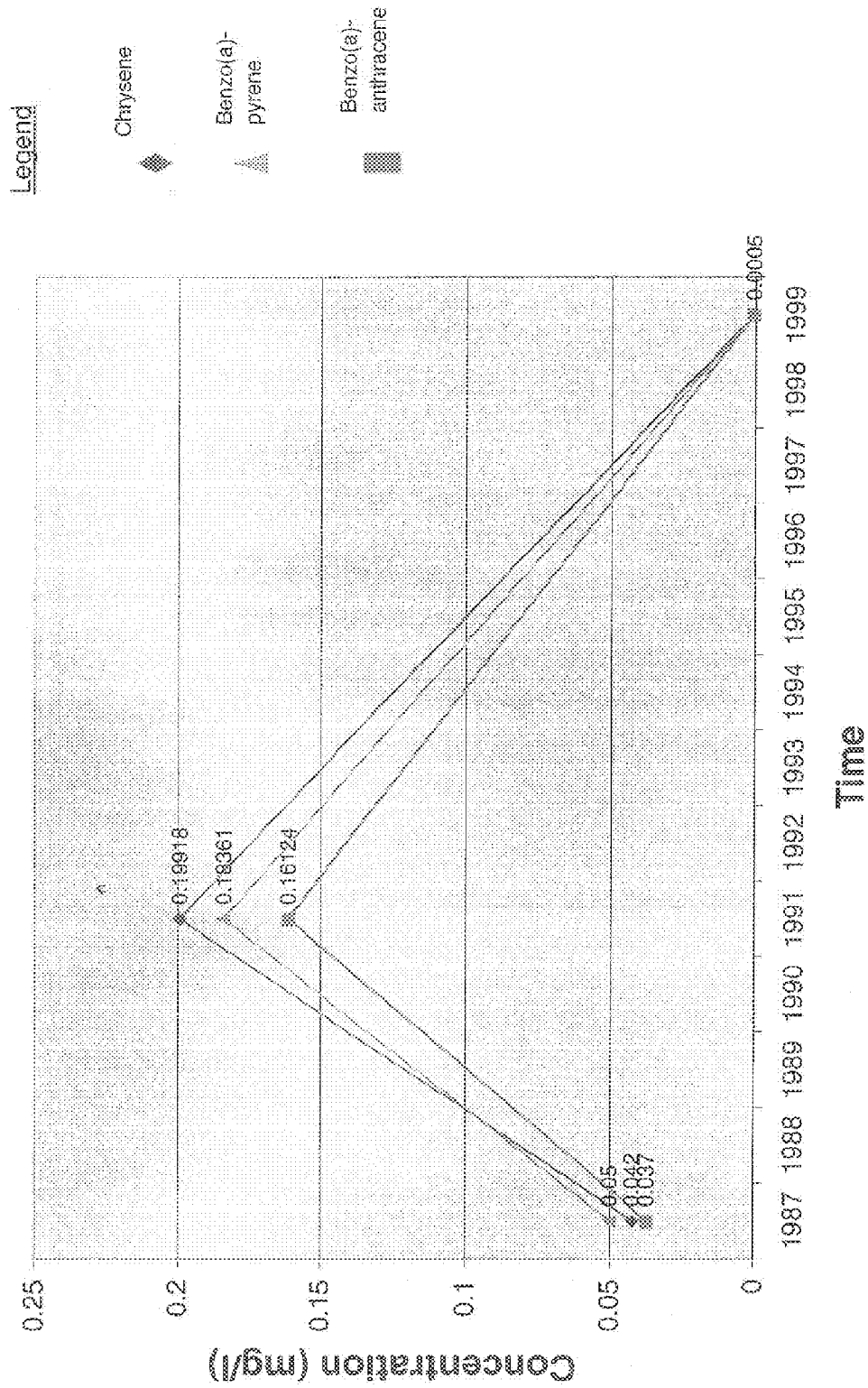


Figure 7-15b
Well P-5: Concentration vs. Time

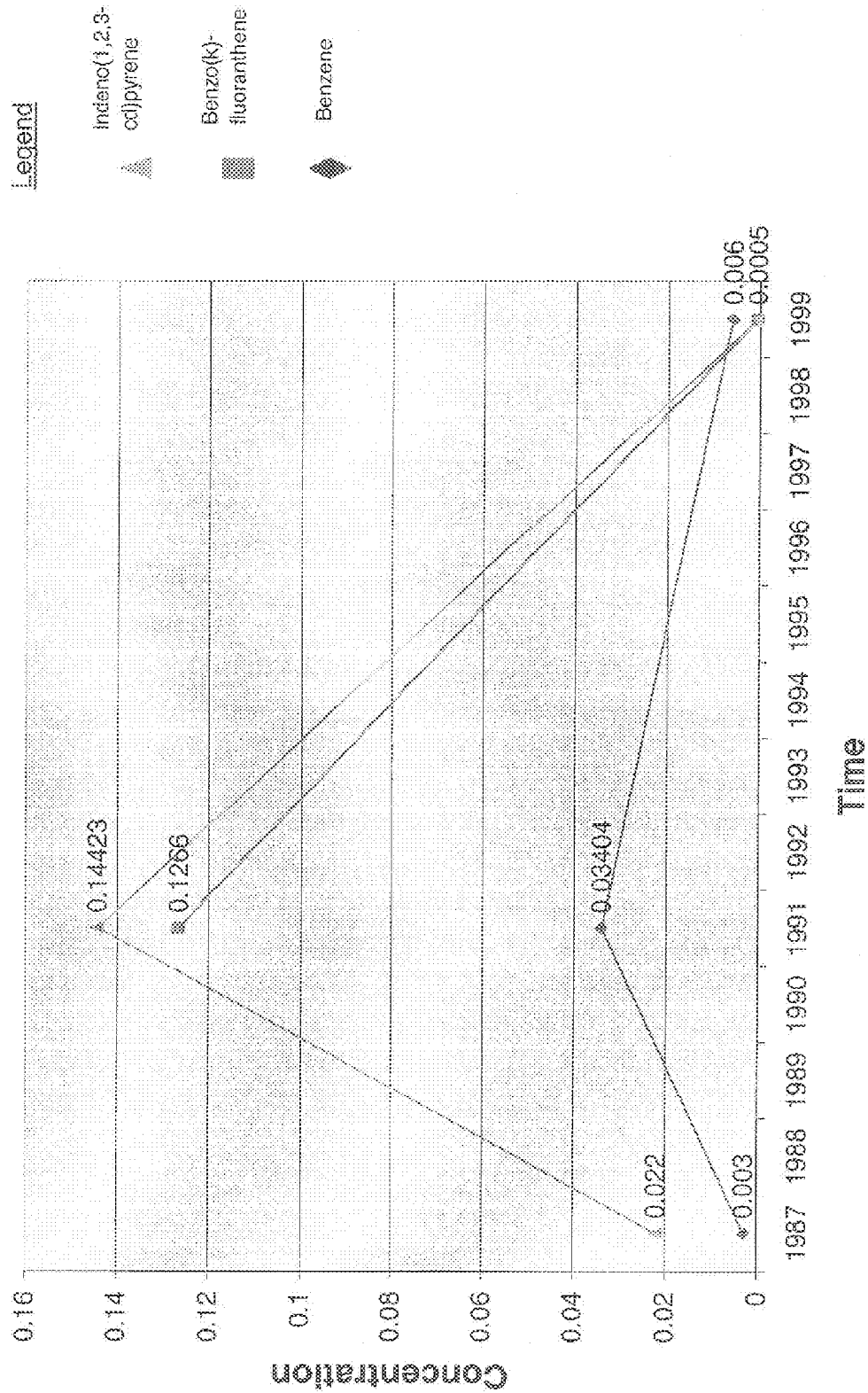


Figure 7-16a
Well P-7: Concentration vs. Time

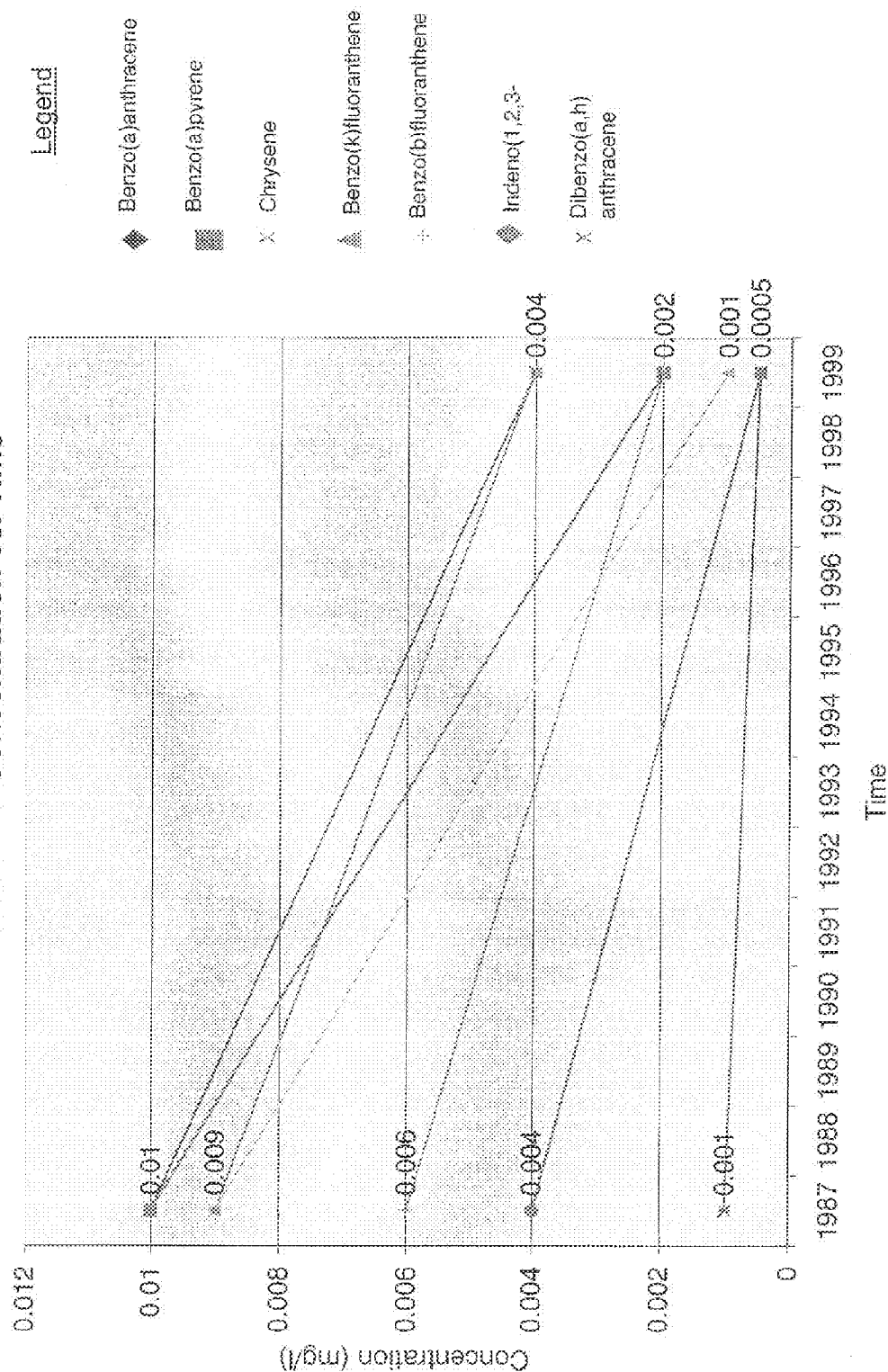


Figure 7-16b
Well P-7: Concentration vs. Time

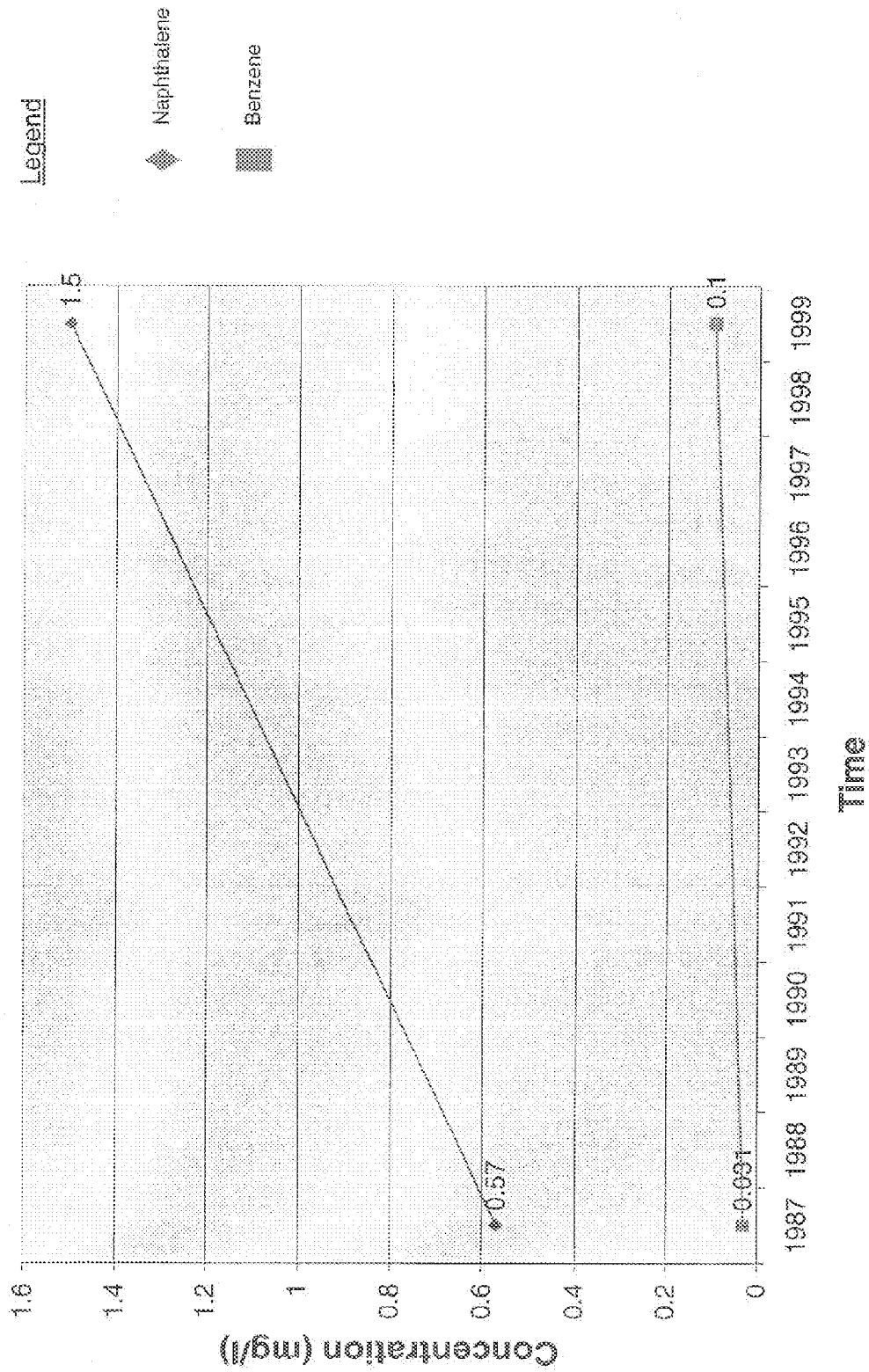


Figure 7-17a
Well P-10: Concentration vs. Time

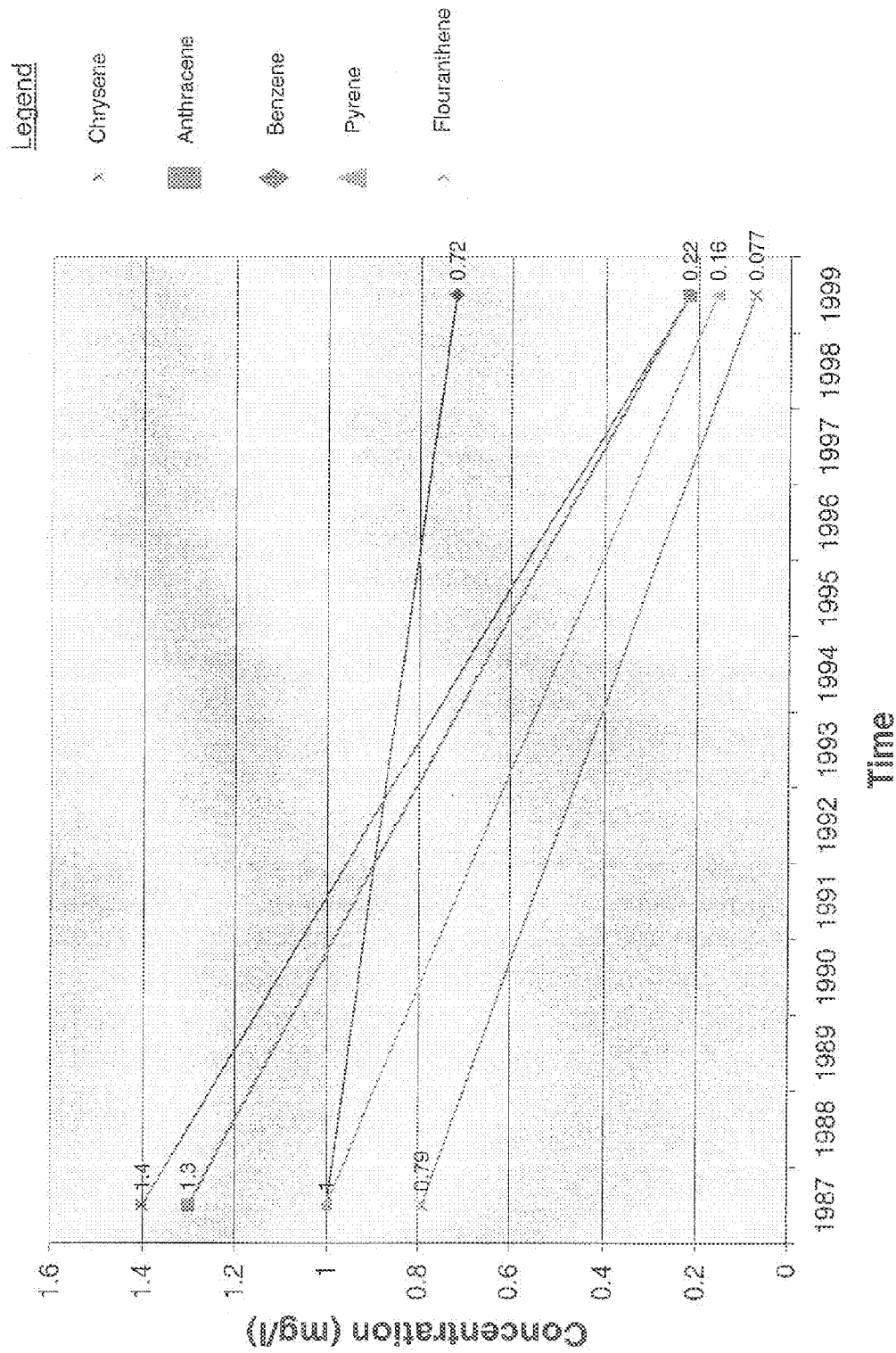


Figure 7-17b
Well P-10: Concentration vs. Time

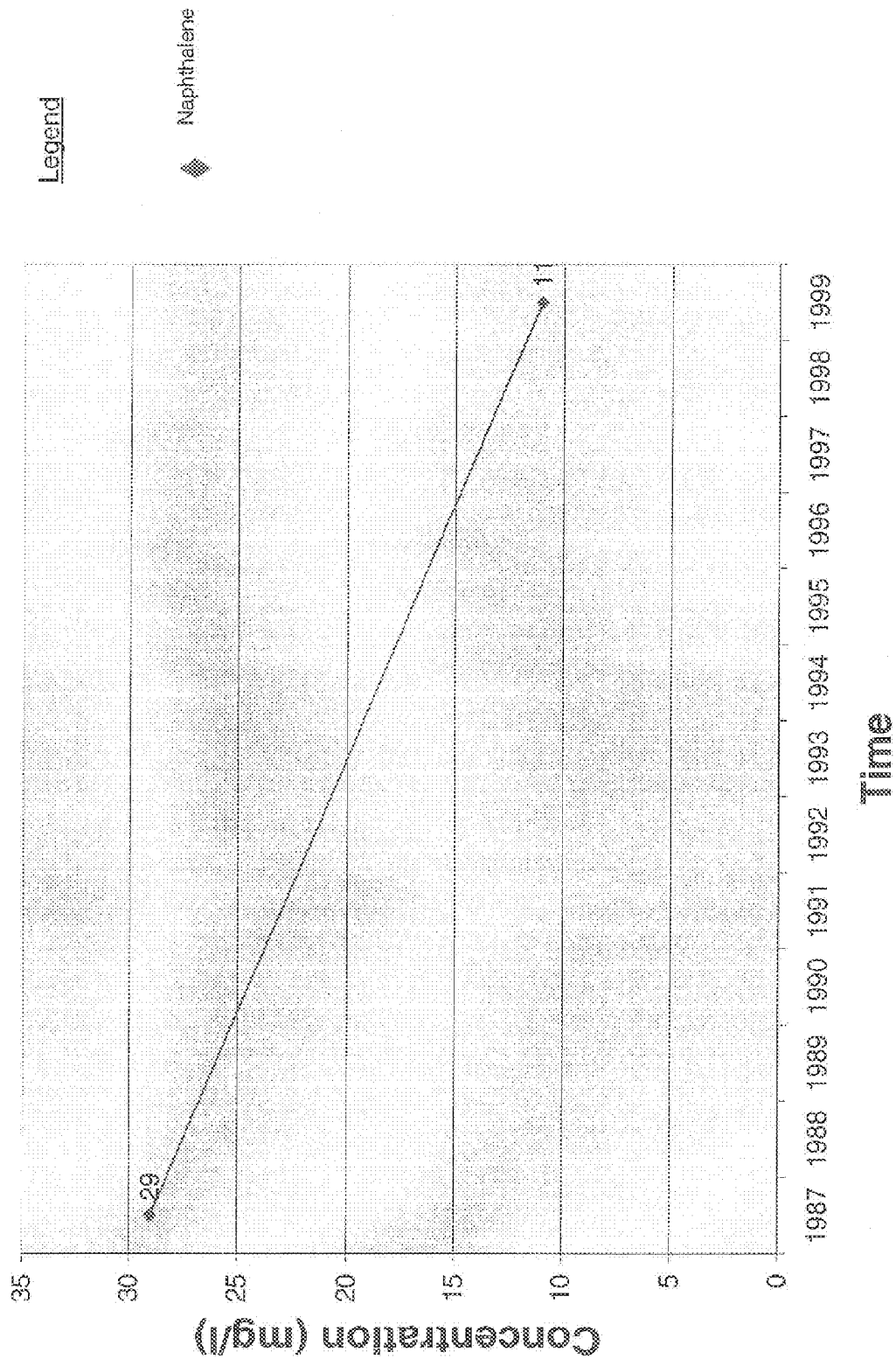


Figure 7-18a
Well P-11S: Concentration vs. Time

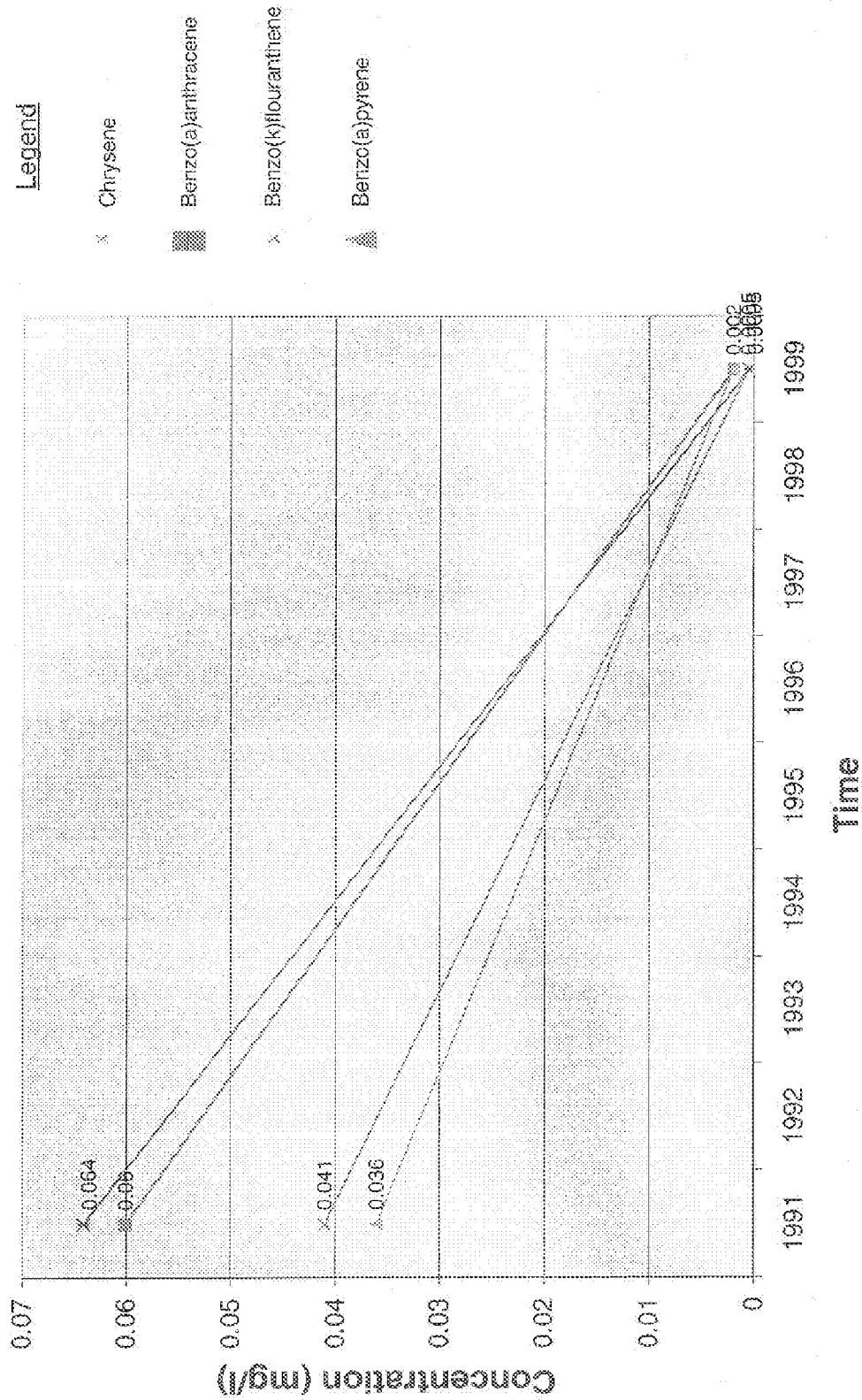
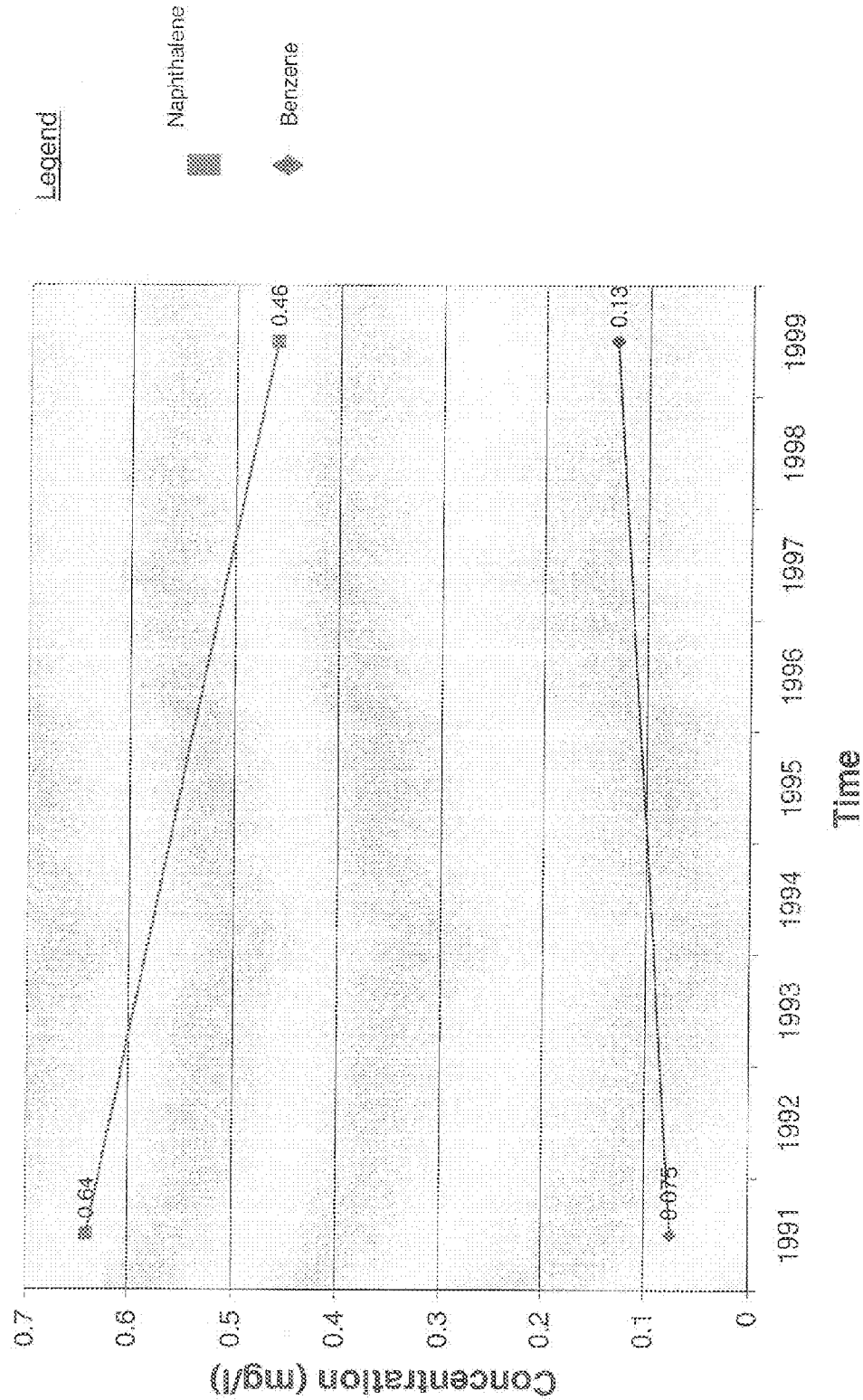


Figure 7-18b
Well P-11S: Concentration vs. Time



TABLES

TAF 2-
ANALYSIS LIST

INORGANICS	METALS (Total & Dissolved)	VOCs	SVOCs	FIELD	MISC.
Ammonia	Aluminum	Bromodichloromethane	Acenaphthene	Temp.	TOC
Cyanide	Antimony	Bromoforn	Acenaphthylene	Sp. Cond.	TSS
Nitrate	Arsenic	Bromomethane	Anthracene	pH	Methane
Sulfate	Barium	Carbon tetrachloride	Benzo(a)anthracene	DO	Ethene
Sulfide	Cadmium	Chloroethane	Benzo(a)pyrene	Redox	Ethane
	Chromium	Chloroform	Benzo(b)fluoranthene	Turbidity	Propane
	Copper	2-Chloroethyl vinyl ether	Benzo(g,h,i)perylene		Thiocyanate
	Iron (total)	Chloromethane	Benzo(k)fluoranthene		Chloride
	Iron (ferrous)	Dibromochloromethane	Chrysene		
	Iron (ferric)	Dichlorodifluoromethane (CFC12)	Dibenzo(a,h)anthracene		
	Lead	1,1-Dichloroethane	Dibenzofuran		
	Manganese	1,2-Dichloroethane	2,4-Dimethylphenol		
	Mercury	1,1-Dichloroethene	Fluoranthene		
	Nickel	cis-1,2-Dichloroethene	Fluorene		
	Selenium	trans-1,2-Dichloroethene	Indeno(1,2,3,cd)pyrene		
	Silver	1,2-Dichloropropane	2-Methylphenol		
	Vanadium	cis-1,3-Dichloropropene	3, 4-Methylphenol		
	Zinc	trans-1,3-Dichloropropene	Naphthalene		
		Methylene chloride	Phenanthrene		
		1,1,2,2-Tetrachloroethane	Phenol		
		Tetrachloroethene (PCE)	Pyrene		
		1,1,1-Trichloroethane (TCA)	2-Methyl Naphthalene		
		1,1,2-Trichloroethane	Total PAHs*		
		Trichloroethene (TCE)			
		Trichlorofluoromethane (CFC11)			
		Vinyl chloride			
		Benzene			
		Chlorobenzene			
		1,2-Dichlorobenzene			
		1,3-Dichlorobenzene			
		1,4-Dichlorobenzene			
		Ethylbenzene			
		Toluene			
		Xylene (total)			

All soil and waste samples were analyzed for inorganics, metals (total only), VOCs and SVOCs.
 All groundwater samples were analyzed for inorganics, metals (total and dissolved), VOCs, SVOCs, field and misc.
 EPA SW846 Methods were used; see Table 6 in QAPP for specific method numbers.

*Summed from individual SVOC results.

5/16/00

Page 1

Table2-1.xls

TABLE 2-2

**PITT CONSOL
BORING SUMMARY TABLE**

Boring No.	AOC No.	Sample Type	Boring No.	AOC No.	Sample Type
A02-01	Perimeter & Former Admin	3	H12-01	AOC 1	3
A05-01	Perimeter & Former Admin	3	F08-01	AOC 1	3
A08-01	Perimeter & Former Admin	3	F07-01	AOC 1	D
A10-01	Perimeter & Former Admin	3	G08-02	AOC 1	W
A13-01	Perimeter & Former Admin	4+k	F11-01	AOC 1	D
B14-01	Perimeter & Former Admin	3	D11-01	AOC 1	D
F15-01	Perimeter & Former Admin	3*	E11-01	AOC 1	D
J16-01	Perimeter & Former Admin	3	E10-01	AOC 1	3
L15-01	Perimeter & Former Admin	3	F12-01	AOC 1	D
M16-01	Perimeter & Former Admin	4+k	E12-01	AOC 1	D
N11-01	Perimeter & Former Admin	3	E13-01	AOC 1	3
N08-01	Perimeter & Former Admin	3	F12-02	AOC 1	D
K06-01	Perimeter & Former Admin	3	F13-01	AOC 1	D
K04-01	Perimeter & Former Admin	3+k	E13-02	AOC 1	D
J02-01	Perimeter & Former Admin	4+k	E14-01	AOC 1	D
H01-01	Perimeter & Former Admin	3	E15-02	AOC 1	D+k
E02-01	Perimeter & Former Admin	3	E15-01	AOC 1	D
B01-01	Perimeter & Former Admin	4+k	D13-01	AOC 1	3
M11-02	AOC 1	3	F14-01	AOC 1	D
K11-01	AOC 1	D	E14-02	AOC 1	D
L12-01	AOC 1	D	D14-01	AOC 1	3

TABLE 2-2

**PITT CONSOL
BORING SUMMARY TABLE**

Boring No.	AOC No.	Sample Type	Boring No.	AOC No.	Sample Type
L10-01	AOC 1	3	C15-01	AOC 1	D
K10-01	AOC 1	D	E08-01	AOC 1	D
I11-01	AOC 1	3	C12-01	AOC 2	3
J11-01	AOC 1	D	A12-01	AOC 2	3
J09-01	AOC 1	D+k	B13-01	AOC 2	3
J08-02	AOC 1	3	B11-01	AOC 2	3
J08-01	AOC 1	D	C06-01	AOC 2	3
I08-01	AOC 1	3	C06-02	AOC 2	3
J06-01	AOC 1	3	C05-01	AOC 2	3+k
H05-01	AOC 1	D	D08-01	AOC 2	3
I07-01	AOC 1	D+k	D09-01	AOC 2	3
I05-01	AOC 1	3*	B08-01	AOC 2	3+k
H07-01	AOC 1	D	B09-01	AOC 2	3
I04-01	AOC 1	D	C10-01	AOC 2	3
I04-02	AOC 1	D	C07-01	AOC 2	3
I03-01	AOC 1	3	D02-01	AOC 3	3
H03-01	AOC 1	D+k	C03-01	AOC 3	3
G03-01	AOC 1	3+k	C02-01	AOC 3	W
H04-01	AOC 1	D	F02-01	AOC 3	3
G05-01	AOC 1	D	E03-01	AOC 3	3
F05-01	AOC 1	3	E02-02	AOC 3	W

TABLE 2-2

**PITT CONSOL
BORING SUMMARY TABLE**

Boring No.	AOC No.	Sample Type	Boring No.	AOC No.	Sample Type
F04-01	AOC 1	D	I02-01	AOC 3	3
G06-01	AOC 1	D	G03-02	AOC 3	W
G06-02	AOC 1	D	J03-02	AOC 3	3
F06-01	AOC 1	D	I03-02	AOC 3	W
E06-01	AOC 1	D	K07-01	AOC 3	3
G08-01	AOC 1	D	K05-01	AOC 3	3
G09-01	AOC 1	D	J07-01	AOC 3	W
G11-01	AOC 1	4+k	L08-01	AOC 3	3
			M09-01	AOC 3	W

Sample Types

3 = Surface fill, biased fill/top of peaty clay and peaty clay

4 = Same as above plus lower confining clay

D = Discrete "worst case" sample

k = Permeability testing of peaty clay

W = Waste sample

Notes

*Peaty clay sample not collected

Table 2-3
Summary Soil Data Statistics - N.J.NRDCSC Criteria
Pltt-Consol SI/RI

ANALYTE	UNITS	NumSmpls	NumHit	NumHitAbove	Avg	Max	Limit	Factor
BENZO(A)PYRENE	mg/kg	218	147	146	233.82	7,400.00	0.66	354.27
BENZO(A)ANTHRACENE	mg/kg	218	156	139	263.70	8,600.00	4	65.93
BENZO(B)FLUORANTHENE	mg/kg	218	156	139	254.12	8,700.00	4	63.53
DIBENZ(A,H)ANTHRACENE	mg/kg	218	73	72	34.50	700.00	0.66	52.27
INDENO(1,2,3-CD)PYRENE	mg/kg	218	122	102	123.73	3,500.00	4	30.93
BENZO(K)FLUORANTHENE	mg/kg	218	124	106	120.12	5,000.00	4	30.03
CHRYSENE	mg/kg	218	157	81	272.06	8,900.00	40	6.80
ARSENIC TR	mg/kg	181	178	56	22.49	741.00	20	1.12
LEAD TR	mg/kg	181	181	36	486.66	18,900.00	600	0.81
NAPHTHALENE	mg/kg	218	176	19	1,985.97	96,000.01	4200	0.47
ZINC TR	mg/kg	181	180	17	648.52	13,000.00	1500	0.43
BENZENE	mg/kg	181	63	17	5.47	230.00	13	0.42
COPPER TR	mg/kg	181	180	3	102.71	2,770.00	600	0.17
FLUORANTHENE	mg/kg	218	188	2	624.76	16,000.00	10000	0.06
PYRENE	mg/kg	218	185	2	495.51	13,000.00	10000	0.05
XYLENE (TOTAL)	mg/kg	181	119	1	43.33	2,000.00	1000	0.04
CARBON TETRACHLORIDE	mg/kg	181	0	0	1.17	31.50	4	0.29
CIS-1,3-DICHLOROPROPENE	mg/kg	181	0	0	1.17	31.50	5	0.23
TRANS-1,3-DICHLOROPROPENE	mg/kg	181	0	0	1.17	31.50	5	0.23
TETRACHLOROETHENE	mg/kg	181	0	0	1.17	31.50	6	0.20
VINYL CHLORIDE	mg/kg	181	0	0	1.17	31.50	7	0.17
1,2-DICHLOROETHANE	mg/kg	181	0	0	1.17	31.50	24	0.05
CHLOROFORM	mg/kg	181	0	0	1.17	31.50	28	0.04
FLUORENE	mg/kg	218	163	0	285.52	9,300.00	10000	0.03
ANTHRACENE	mg/kg	218	163	0	281.19	5,100.00	10000	0.03
1,2-DICHLOROPROPANE	mg/kg	181	0	0	1.17	31.50	43	0.03
BROMODICHLOROMETHANE	mg/kg	181	0	0	1.17	31.50	46.00	0.03
ACENAPHTHENE	mg/kg	218	158	0	244.71	6,000.00	10000.00	0.02
NICKEL TR	mg/kg	181	181	0	57.44	1,010.00	2400.00	0.02
TRICHLOROETHENE	mg/kg	181	1	0	1.18	31.50	54.00	0.02
CADMIUM TR	mg/kg	181	117	0	1.82	30.80	100.00	0.02
TOLUENE	mg/kg	181	99	0	17.82	560.00	1000.00	0.02
1,1,2,2-TETRACHLOROETHANE	mg/kg	181	0	0	1.17	31.50	70.00	0.02
MERCURY	mg/kg	181	123	0	4.49	270.00	270.00	0.02
VANADIUM TR	mg/kg	181	181	0	110.68	2,920.00	7100.00	0.02
4-METHYLPHENOL	mg/kg	181	87	0	110.80	2,500.00	10000.00	0.01
BARIUM TR	mg/kg	181	181	0	484.41	10,700.00	47000.00	0.01
PHENOL	mg/kg	181	78	0	96.00	3,000.00	10000.00	0.01
ANTIMONY TR	mg/kg	181	77	0	3.16	81.80	340.00	0.01
ETHYLBENZENE	mg/kg	181	91	0	8.97	250.00	1000.00	0.01
2,4-DIMETHYLPHENOL	mg/kg	181	99	0	84.99	1,600.00	10000.00	0.01
1,1-DICHLOROETHENE	mg/kg	181	0	0	1.17	31.50	150.00	0.01
2-METHYLPHENOL	mg/kg	181	75	0	58.51	1,700.00	10000.00	0.01
METHYLENE CHLORIDE	mg/kg	181	0	0	1.17	31.50	210.00	0.01
BROMOFORM	mg/kg	181	0	0	1.17	31.50	370.00	0.00
1,1,2-TRICHLOROETHANE	mg/kg	181	0	0	1.17	31.50	420.00	0.00
CHLOROBENZENE	mg/kg	181	0	0	1.17	31.50	680.00	0.00
1,1-DICHLOROETHANE	mg/kg	181	0	0	1.17	31.50	1000.00	0.00
DIBROMOCHLOROMETHANE	mg/kg	181	0	0	1.17	31.50	1000.00	0.00
CIS-1,2-DICHLOROETHENE	mg/kg	181	0	0	1.17	31.50	1000.00	0.00
CHLOROMETHANE	mg/kg	181	0	0	1.17	31.50	1000.00	0.00
BROMOMETHANE	mg/kg	181	0	0	1.17	31.50	1000.00	0.00
1,1,1-TRICHLOROETHANE	mg/kg	181	0	0	1.17	31.50	1000.00	0.00
SELENIUM TR	mg/kg	181	60	0	2.28	59.50	3100.00	0.00
SILVER TR	mg/kg	181	68	0	0.64	9.44	4100.00	0.00
1,2-DICHLOROBENZENE	mg/kg	181	1	0	1.21	31.50	10000.00	0.00
TRANS-1,2-DICHLOROETHENE	mg/kg	181	0	0	1.17	31.50	10000.00	0.00
1,4-DICHLOROBENZENE	mg/kg	181	0	0	1.17	31.50	10000.00	0.00
1,3-DICHLOROBENZENE	mg/kg	181	0	0	1.17	31.50	10000.00	0.00
TOTAL CYANIDE (SOLID)	mg/kg	181	20	0	0.66	11.60	21000.00	0.00

NumSmpls = Number of Samples
Avg = Average concentration
Limit = NRDCSC Criteria

NumHit = Number of Hits
Max = Maximum concentration encountered
Factor = Average concentration divided by Limit

Table 2-4
Perimeter Soil Data Statistics - N.J. RDCSC Criteria
Pitt-Consol SI/RI

ANALYTE	UNITS	NumSmpls	NumHits	NumHitsAbove	Avg	Max	LIMIT	Factor
BENZO(A)PYRENE	mg/kg	54	34	34	138.76	2,300.00	0.66	210.25
BENZO(A)ANTHRACENE	mg/kg	54	35	34	159.71	2,400.00	0.90	177.46
BENZO(B)FLUORANTHENE	mg/kg	54	35	32	134.98	2,400.00	0.90	149.98
BENZO(K)FLUORANTHENE	mg/kg	54	26	26	78.37	1,200.00	0.90	87.08
INDENO(1,2,3-CD)PYRENE	mg/kg	54	30	27	72.43	1,400.00	0.90	80.47
DIBENZ(A,H)ANTHRACENE	mg/kg	54	15	14	31.83	420.00	0.66	48.22
CHRYSENE	mg/kg	54	35	22	172.07	2,400.00	9.00	19.12
NAPHTHALENE	mg/kg	54	32	16	3,103.71	96,000.01	230.00	13.49
LEAD TR	mg/kg	54	54	13	648.50	18,900.00	400.00	1.62
ARSENIC TR	mg/kg	54	53	14	28.64	741.00	20.00	1.43
BENZENE	mg/kg	54	13	4	4.22	81.00	3.00	1.41
ZINC TR	mg/kg	54	53	5	632.40	13,000.00	1500.00	0.42
BARIUM TR	mg/kg	54	54	7	246.22	2,750.00	700.00	0.35
ANTIMONY TR	mg/kg	54	21	3	4.28	81.80	14.00	0.31
MERCURY	mg/kg	54	32	2	4.20	111.00	14.00	0.30
COPPER TR	mg/kg	54	54	3	161.39	2,770.00	600.00	0.27
VANADIUM TR	mg/kg	54	54	3	71.60	922.00	370.00	0.19
PYRENE	mg/kg	54	39	4	307.51	4,300.00	1700.00	0.18
FLUORANTHENE	mg/kg	54	43	2	368.04	6,600.00	2300.00	0.16
NICKEL TR	mg/kg	54	54	2	38.55	335.00	250.00	0.16
FLUORENE	mg/kg	54	35	1	265.28	9,300.00	2300.00	0.12
XYLENE (TOTAL)	mg/kg	54	24	1	28.70	620.00	410.00	0.07
ACENAPHTHENE	mg/kg	54	32	1	196.95	6,000.00	3400.00	0.06
2,4-DIMETHYLPHENOL	mg/kg	54	15	1	41.78	1,600.00	1100.00	0.04
CARBON TETRACHLORIDE	mg/kg	54	0	0	1.23	31.50	2.00	0.61
VINYL CHLORIDE	mg/kg	54	0	0	1.23	31.50	2.00	0.61
TRANS-1,3-DICHLOROPROPENE	mg/kg	54	0	0	1.23	31.50	4.00	0.31
TETRACHLOROETHENE	mg/kg	54	0	0	1.23	31.50	4.00	0.31
1,2-DICHLOROETHANE	mg/kg	54	0	0	1.23	31.50	6.00	0.20
1,1-DICHLOROETHENE	mg/kg	54	0	0	1.23	31.50	8.00	0.15
BROMODICHLOROMETHANE	mg/kg	54	0	0	1.23	31.50	11.00	0.11
CHLOROFORM	mg/kg	54	0	0	1.23	31.50	19.00	0.06
1,1,2-TRICHLOROETHANE	mg/kg	54	0	0	1.23	31.50	22.00	0.06
TRICHLOROETHENE	mg/kg	54	1	0	1.24	31.50	23.00	0.05
1,1,2,2-TETRACHLOROETHANE	mg/kg	54	0	0	1.23	31.50	34.00	0.04
CHLOROBENZENE	mg/kg	54	0	0	1.23	31.50	37.00	0.03
SELENIUM TR	mg/kg	54	17	0	1.78	11.00	63.00	0.03
CADMIUM TR	mg/kg	54	25	0	1.03	8.55	38.00	0.03
METHYLENE CHLORIDE	mg/kg	54	0	0	1.23	31.50	49.00	0.03
4-METHYLPHENOL	mg/kg	54	15	0	61.94	2,100.00	2800.00	0.02
ANTHRACENE	mg/kg	54	35	0	188.61	5,100.00	10000.00	0.02
BROMOMETHANE	mg/kg	54	0	0	1.23	31.50	79.00	0.02
CIS-1,2-DICHLOROETHENE	mg/kg	54	0	0	1.23	31.50	79.00	0.02
BROMOFORM	mg/kg	54	0	0	1.23	31.50	86.00	0.01
TOLUENE	mg/kg	54	18	0	12.13	330.00	1000.00	0.01
DIBROMOCHLOROMETHANE	mg/kg	54	0	0	1.23	31.50	110.00	0.01
SILVER TR	mg/kg	54	16	0	0.75	9.44	110.00	0.01
ETHYLBENZENE	mg/kg	54	20	0	6.62	120.00	1000.00	0.01
1,1,1-TRICHLOROETHANE	mg/kg	54	0	0	1.23	31.50	210.00	0.01
PHENOL	mg/kg	54	13	0	37.33	980.00	10000.00	0.00
CHLOROMETHANE	mg/kg	54	0	0	1.23	31.50	520.00	0.00
1,1-DICHLOROETHANE	mg/kg	54	0	0	1.23	31.50	570.00	0.00
1,4-DICHLOROBENZENE	mg/kg	54	0	0	1.23	31.50	570.00	0.00
TRANS-1,2-DICHLOROETHENE	mg/kg	54	0	0	1.23	31.50	1000.00	0.00
TOTAL CYANIDE (SOLID)	mg/kg	54	6	0	0.73	11.60	1100.00	0.00
1,2-DICHLOROBENZENE	mg/kg	54	0	0	1.23	31.50	5100.00	0.00
1,3-DICHLOROBENZENE	mg/kg	54	0	0	1.23	31.50	5100.00	0.00

NumSmpls = Number of Samples
Avg = Average concentration
Limit = NRDCSC Criteria

NumHits = Number of Hits
Max = Maximum concentration encountered
Factor = Average concentration divided by Limit

NumHitsAbove = Number of Hits above Criteria

Table 2-5

Comparison of Historic Fill to Pitt-Consol Soil Data
Metals Concentration

<u>Contaminant</u>	<u>Typical Historic Fill (mg/kg)¹</u>		<u>Pitt-Consol Soil Data (mg/kg)²</u>	
	<u>Maximum</u>	<u>Average</u>	<u>Maximum</u>	<u>Average</u>
Arsenic	1,098	13.15	741	22.49
Beryllium	80	1.23	NR	NR
Cadmium	510	11.15	31	1.82
Lead	10,700	574.00	18,900	486.66
Zinc	10,900	5,756.00	13,000	648.52

- Notes: 1 Taken from N.J.A.C. 7:26E, Technical Requirements for Site Remediation, Table 4-2.
2 Selected data from Pitt-Consol SI/RI analytical results.
NR Analysis not requested.

Table 2-6
Summary Shallow Well Data Statistics Compared to N.J. Class IIA Groundwater Criteria
Pitt-Consol S/R/I

ANALYTE	UNITS	NumSmpls	NumHit	NumHitAbove	Avg	Max	LIMIT	Factor
BENZENE	mg/l	14	12	12	0.21	1.40	0.001	211.21
BENZO(K)FLUORANTHENE	mg/l	14	4	2	0.09	1.20	0.002	45.86
BENZO(A)ANTHRACENE	mg/l	14	6	2	0.37	4.90	0.010	36.68
2,4-DIMETHYLPHENOL	mg/l	14	11	7	3.52	23.00	0.100	35.21
IRON	mg/l	14	14	14	8.49	69.30	0.300	28.30
BENZO(B)FLUORANTHENE	mg/l	14	5	2	0.24	3.10	0.010	23.80
CHRYSENE	mg/l	14	6	2	0.37	4.90	0.020	18.34
AMMONIA NITROGEN	mg/l	14	13	11	5.93	21.40	0.500	11.86
BENZO(A)PYRENE	mg/l	14	5	2	0.21	2.70	0.020	10.26
MANGANESE TR	mg/l	14	14	14	0.50	2.00	0.050	9.93
ARSENIC TR	mg/l	14	8	8	0.07	0.86	0.008	9.32
XYLENE (TOTAL)	mg/l	14	12	8	0.34	1.80	0.040	8.50
PYRENE	mg/l	14	8	2	1.19	16.00	0.200	5.93
FLUORENE	mg/l	14	9	2	1.66	22.00	0.300	5.54
INDENO(1,2,3-CD)PYRENE	mg/l	14	3	2	0.11	1.40	0.020	5.37
FLUORANTHENE	mg/l	14	9	2	1.57	21.00	0.300	5.24
ACENAPHTHENE	mg/l	14	11	3	1.85	24.00	0.400	4.62
LEAD TR	mg/l	14	5	4	0.02	0.17	0.010	2.29
DIBENZ(A,H)ANTHRACENE	mg/l	14	2	2	0.03	0.42	0.020	1.62
CHLOROBENZENE	mg/l	14	4	1	0.01	0.04	0.004	1.31
SULFATE BY IC (SOLID)	mg/l	14	14	6	305.09	1,520.00	250.000	1.22
PHENOL	mg/l	14	9	2	4.45	50.00	4.000	1.11
CHROMIUM TR	mg/l	14	12	2	0.10	1.21	0.100	1.02
ALUMINUM	mg/l	14	9	4	0.19	0.72	0.200	0.97
ANTHRACENE	mg/l	14	9	1	0.82	11.00	2.000	0.41
TOLUENE	mg/l	14	12	1	0.31	1.90	1.000	0.31
BARIUM TR	mg/l	14	14	1	0.42	2.13	2.000	0.21
NICKEL TR	mg/l	14	8	1	0.02	0.16	0.100	0.18
ETHYLBENZENE	mg/l	14	10	1	0.12	0.76	0.700	0.17
TOTAL CYANIDE (SOLID)	mg/l	14	3	1	0.03	0.34	0.200	0.13
METHYLENE CHLORIDE	mg/l	14	0	0	0.01	0.03	0.002	2.54
1,1,2,2-TETRACHLOROETHANE	mg/l	14	0	0	0.01	0.03	0.002	2.54
1,2-DICHLOROETHANE	mg/l	14	0	0	0.01	0.03	0.002	2.54
TRICHLOROETHENE	mg/l	14	0	0	0.00	0.01	0.001	2.54
TETRACHLOROETHENE	mg/l	14	0	0	0.00	0.01	0.001	2.54
1,2-DICHLOROPROPANE	mg/l	14	0	0	0.00	0.01	0.001	2.54
BROMODICHLOROMETHANE	mg/l	14	0	0	0.00	0.01	0.001	2.54
1,1,2-TRICHLOROETHANE	mg/l	14	0	0	0.01	0.03	0.003	1.69
1,1-DICHLOROETHENE	mg/l	14	0	0	0.00	0.01	0.002	1.27
CARBON TETRACHLORIDE	mg/l	14	0	0	0.00	0.01	0.002	1.27
VINYL CHLORIDE	mg/l	14	0	0	0.01	0.03	0.005	1.01
BROMOMETHANE	mg/l	14	0	0	0.01	0.04	0.010	0.76
BROMOFORM	mg/l	14	0	0	0.00	0.01	0.004	0.63
DIBROMOCHLOROMETHANE	mg/l	14	0	0	0.01	0.03	0.010	0.51
CHLOROFORM	mg/l	14	0	0	0.00	0.01	0.006	0.42
CHLOROMETHANE	mg/l	14	0	0	0.01	0.04	0.030	0.25
MERCURY	mg/l	14	5	0	0.00	0.00	0.002	0.19
ANTIMONY TR	mg/l	14	0	0	0.00	0.00	0.020	0.15
1,1,1-TRICHLOROETHANE	mg/l	14	0	0	0.00	0.01	0.030	0.08
CADMIUM TR	mg/l	14	0	0	0.00	0.00	0.004	0.08
1,4-DICHLOROBENZENE	mg/l	14	1	0	0.01	0.03	0.075	0.08
1,1-DICHLOROETHANE	mg/l	14	0	0	0.01	0.03	0.070	0.07
SELENIUM TR	mg/l	14	1	0	0.00	0.01	0.050	0.07
TRANS-1,2-DICHLOROETHENE	mg/l	14	0	0	0.01	0.03	0.100	0.05
SILVER TR	mg/l	14	3	0	0.00	0.00	0.020	0.05
NITRATE BY IC (SOLID)	mg/l	14	1	0	0.35	2.26	10.000	0.03
COPPER TR	mg/l	14	7	0	0.01	0.05	1.000	0.01
1,2-DICHLOROBENZENE	mg/l	14	0	0	0.01	0.03	0.600	0.01
1,3-DICHLOROBENZENE	mg/l	14	0	0	0.01	0.03	0.600	0.01
ZINC TR	mg/l	14	13	0	0.04	0.21	5.000	0.01

NumSmpls = Number of Samples
 Avg = Average concentration
 Limit = Class IIA Groundwater Criteria

NumHit = Number of Hits
 Max = Maximum concentration encountered
 Factor = Average concentration divided by the Limit

NumHitAbove = Number of Hits above Criteria

Table 2-7
Summary Deep Well Data Statistics Compared to N.J. Class IIA Groundwater Criteria
Pitt-Consol SI/R1

ANALYTE	UNITS	NumSmps	NumHit	NumHitAbove	Avg	Max	Limit	Factor
BENZENE	mg/l	5	5	5	2.62	7.30	0.001	2,620.00
2,4-DIMETHYLPHENOL	mg/l	5	5	5	56.24	180.00	0.100	562.40
IRON	mg/l	5	5	5	12.08	32.40	0.300	40.27
AMMONIA NITROGEN	mg/l	5	5	5	19.48	31.70	0.500	38.96
XYLENE (TOTAL)	mg/l	5	5	5	1.24	2.20	0.040	31.00
MANGANESE TR	mg/l	5	5	5	1.12	2.50	0.050	22.33
PHENOL	mg/l	5	5	3	75.21	210.00	4.000	18.80
CHLOROBENZENE	mg/l	5	2	2	0.05	0.19	0.004	11.68
ARSENIC TR	mg/l	5	3	3	0.06	0.27	0.008	8.00
SULFATE BY IC (SOLID)	mg/l	5	4	3	1,746.17	5,220.00	250.000	6.98
ALUMINUM	mg/l	5	5	4	1.13	2.54	0.200	5.65
BENZO(K)FLUORANTHENE	mg/l	5	1	1	0.01	0.02	0.002	4.90
TOLUENE	mg/l	5	5	2	1.83	5.20	1.000	1.83
BENZO(A)ANTHRACENE	mg/l	5	1	1	0.01	0.04	0.010	1.40
BENZO(B)FLUORANTHENE	mg/l	5	1	1	0.01	0.03	0.010	1.28
MERCURY	mg/l	5	1	1	0.00	0.01	0.002	1.06
CHRYSENE	mg/l	5	1	1	0.01	0.03	0.020	0.68
BENZO(A)PYRENE	mg/l	5	1	1	0.01	0.02	0.020	0.59
1,1,2,2-TETRACHLOROETHANE	mg/l	5	0	0	0.01	0.03	0.002	4.60
TETRACHLOROETHENE	mg/l	5	0	0	0.00	0.01	0.001	4.60
TRICHLOROETHENE	mg/l	5	0	0	0.00	0.01	0.001	4.60
METHYLENE CHLORIDE	mg/l	5	0	0	0.01	0.03	0.002	4.60
1,2-DICHLOROETHANE	mg/l	5	0	0	0.01	0.03	0.002	4.60
BROMODICHLOROMETHANE	mg/l	5	0	0	0.00	0.01	0.001	4.60
1,2-DICHLOROPROPANE	mg/l	5	0	0	0.00	0.01	0.001	4.60
1,1,2-TRICHLOROETHANE	mg/l	5	0	0	0.01	0.03	0.003	3.07
CARBON TETRACHLORIDE	mg/l	5	0	0	0.00	0.01	0.002	2.30
1,1-DICHLOROETHENE	mg/l	5	0	0	0.00	0.01	0.002	2.30
VINYL CHLORIDE	mg/l	5	0	0	0.01	0.03	0.005	1.84
BROMOMETHANE	mg/l	5	0	0	0.01	0.04	0.010	1.38
BROMOFORM	mg/l	5	0	0	0.00	0.01	0.004	1.15
DIBROMOCHLOROMETHANE	mg/l	5	0	0	0.01	0.03	0.010	0.92
CHLOROFORM	mg/l	5	0	0	0.00	0.01	0.006	0.77
LEAD TR	mg/l	5	2	0	0.01	0.01	0.010	0.54
INDENO(1,2,3-CD)PYRENE	mg/l	5	1	0	0.01	0.02	0.020	0.47
CHLOROMETHANE	mg/l	5	0	0	0.01	0.04	0.030	0.46
ETHYLBENZENE	mg/l	5	5	0	0.31	0.46	0.700	0.45
DIBENZ(A,H)ANTHRACENE	mg/l	5	0	0	0.01	0.02	0.020	0.38
ACENAPHTHENE	mg/l	5	4	0	0.12	0.34	0.400	0.29
FLUORENE	mg/l	5	3	0	0.07	0.24	0.300	0.24
CHROMIUM TR	mg/l	5	4	0	0.02	0.04	0.100	0.19
1,1,1-TRICHLOROETHANE	mg/l	5	0	0	0.00	0.01	0.030	0.15
1,1-DICHLOROETHANE	mg/l	5	1	0	0.01	0.03	0.070	0.15
BARIUM TR	mg/l	5	5	0	0.27	0.94	2.000	0.13
ANTIMONY TR	mg/l	5	0	0	0.00	0.00	0.020	0.13
1,4-DICHLOROBENZENE	mg/l	5	0	0	0.01	0.03	0.075	0.12
PYRENE	mg/l	5	2	0	0.02	0.08	0.200	0.12
FLUORANTHENE	mg/l	5	3	0	0.03	0.13	0.300	0.11
TRANS-1,2-DICHLOROETHENE	mg/l	5	0	0	0.01	0.03	0.100	0.09
CADMIUM TR	mg/l	5	0	0	0.00	0.00	0.004	0.08
SELENIUM TR	mg/l	5	1	0	0.00	0.01	0.050	0.08
TOTAL CYANIDE (SOLID)	mg/l	5	4	0	0.01	0.03	0.200	0.07
NICKEL TR	mg/l	5	2	0	0.01	0.01	0.100	0.05
SILVER TR	mg/l	5	1	0	0.00	0.00	0.020	0.05
NITRATE BY IC (SOLID)	mg/l	5	0	0	0.20	0.20	10.000	0.02
ZINC TR	mg/l	5	5	0	0.09	0.39	5.000	0.02
1,2-DICHLOROBENZENE	mg/l	5	0	0	0.01	0.03	0.600	0.02
1,3-DICHLOROBENZENE	mg/l	5	0	0	0.01	0.03	0.600	0.02
ANTHRACENE	mg/l	5	2	0	0.02	0.08	2.000	0.01
COPPER TR	mg/l	5	2	0	0.01	0.02	1.000	0.01

NumSmps = Number of Samples
Avg = Average concentration
Limit = Class IIA Groundwater Criteria

NumHit = Number of Hits
Max = Maximum concentration encountered
Factor = Average concentration divided by Limit